CITY OF LODI
INFORMAL INFORMATIONAL MEETING
"SHIRTSLEEVE" SESSION
CARNEGIE FORUM, 305 WEST PINE STREET
TUESDAY, NOVEMBER 13, 2001

An Informal Informational Meeting ("Shirtsleeve" Session) of the Lodi City Council was held Tuesday, November 13, 2001 commencing at 7:03 a.m.

A. ROLL CALL

Present: Council Members – Hitchcock (arrived at 7:05 a.m.), Howard, Land, Pennino and Mayor Nakanishi

Absent: Council Members – None

Also Present: City Manager Flynn, City Attorney Hays, and City Clerk Blackston

B. CITY COUNCIL CALENDAR UPDATE

City Clerk Blackston reviewed the weekly calendar (filed).

City Manager Flynn thanked Community Promotions Coordinator Cynthia Haynes for coordinating the Veterans Day Parade.

C. TOPIC(S)

C-1 "Water System Chlorination"

City Manager Flynn announced that today's discussion is related to the chlorination order that the City received from the State at the end of October. It is the opinion of staff that the City has a safe, high-quality water system.

Public Works Director Prima stated he was confident that Fran Forkas, Water/Wastewater Superintendent, and Frank Beeler, Assistant Water/Wastewater Superintendent, have been doing an excellent job in operating the City's water system.

Mr. Beeler reported that the California Department of Health Services regulates the water system and issues permits. Currently, Lodi only chlorinates its water when deemed necessary. On October 25, the Department of Health Services issued an order directing Lodi to chlorinate its drinking water system full time. He explained that water must be free of disease-causing organisms, but it does not have to be sterile. Public Works conducts regular testing as directed by the State and Environmental Protection Agency regulations. Sampling is done weekly at the distribution systems. Referencing information distributed to Council (filed), Mr. Beeler reported that to date 821 samples have been taken that were reportable, and 222 were invalidation resamples. Lodi takes over 1,000 samples each year of its drinking water system to ensure compliance with Federal and State regulations. The total coliform bacteria cannot exceed 5%. On average, less than 2% of the City's samples test positive for coliform.

In response to Council Member Hitchcock, Mr. Beeler reported that the positive results are found randomly throughout the system.

Mr. Beeler explained that there are five or six approved methods of testing for coliform bacteria. Lodi uses the multiple tube fermentation technique, which relies on a series of tests and is the standard for defining coliform bacteria.

Mike Schafer, Laboratory Services Supervisor, distributed sample test tubes to Council for demonstration purposes.

Mr. Beeler described the multiple tube testing process. He stated that there is also a one-step test, in which results are observed after 24 hours. In the one-step test there are no

intermediary steps for indicators, growth, or presumptives. Results are either positive or negative for coliform and that is all that is reported. Mr. Beeler explained that the reason staff prefers the multiple tube test process is because it allows for indicators, which are very helpful in managing a non-chlorinated system. The controversy that has arisen with using the multiple tube test is that the State sees the presumptive results and those with growth that do not produce gas. Standard method regulations state to transfer the sample to the next step even if gas was not produced, which Lodi did up until 1994. At that time the Local Health Department pointed out that Federal regulations require that such samples should be invalidated, not counted, and additional samples taken until it either produces gas in the presumptive stage or it is totally clear. From this latter method, the State sees reports of many invalidated samples, which indicates to them that there may be a problem. Subsequent to this, the City was directed to change the testing method several more times. Mr. Beeler stated that he is not aware of any other districts in California that have directed municipalities to invalidate samples. In 1998 the City exceeded by 1.1% the maximum percentage of total coliform positive samples. Staff believed that a lot of the positive results were non-harmful coliform bacteria coming from the distribution system. A consultant was hired to prepare the State required comprehensive biofilm study and to comprehensively inspect the City's water system. The consultant did not prepare the biofilm study, as he determined it was not necessary. On August 6, the City received a citation for not submitting the required biofilm study. On October 5, a draft biofilm study was sent to the State and without any further contact, the Department of Health Services delivered an order to chlorinate. The City has 30 days from the date of the order to appeal. Mr. Beeler noted that he contacted the Public Health Department who tracks all diseases reported, and for the years 1994, 1998, and 2001 there were no gastrointestinal outbreaks of disease in Lodi.

In answer to Mayor Nakanishi, Mr. Beeler explained that even chlorinated systems have biofilm. Biofilm can be found on the inside of water mains, and can be various types and thicknesses. Biofilm is any biological activity. The potential exists that biological film attached to the pipes could harbor pathogenic organisms; however, in that case the organisms would have to be introduced to the system.

Mr. Beeler reported that Lodi maintains more stringent standards than the State requires. A granular activated carbon treatment system for dibromochloropropane (DBCP) is used.

In response to Council Member Howard, Mr. Prima stated that he spoke with Mr. Haberman about the possibility of an extension. Mr. Haberman indicated that they would likely approve an extension if the City provided additional information showing that it intends to chlorinate the system.

Mayor Pro Tempore Pennino asked Mr. Forkas and Mr. Beeler if, in their professional opinion, Lodi's water is safe without chlorination, and both answered in the affirmative.

In reply to Council Member Hitchcock, Mr. Beeler explained that if a municipality uses surface water, it is required to chlorinate it. In the case of groundwater, chlorination is only required as needed.

Council Member Land asked if there are any side effects to the consumer by chlorinating the water.

Mr. Beeler replied that when chlorine combines with water, it does not specifically attack coliform bacteria. If there are any organics in the system, it creates disinfection byproducts, which are possible cancer-causing agents. Some individuals may be allergic to chlorine. The taste and smell of the chlorinated water will be different.

In answer to Council Member Land, City Attorney Hays stated that there appears to be no science to justify the chlorination order and the expense of altering a water system that is delivering a product that meets standards. He explained that the Health and Safety Code procedure states that an order may be challenged within 30 days by filing a writ of mandate in Superior Court.

In reply to Mayor Nakanishi, Mr. Beeler confirmed that the City's wells are secure from the possibility of contamination.

Mayor Pro Tempore Pennino recommended that staff and one member of the Council meet with Assemblyman Pescetti, Field Representative John Beckman, and Congressman Pombo.

Council Member Howard expressed her interest in being included in the meeting.

It was the concurrence of Council to hold a special City Council closed session meeting next Tuesday to discuss possible initiation of litigation.

Council Member Howard reported that a number of individuals in the community sent faxes or left messages on voice mail regarding their concern about the City looking into chlorinating the water. Many people in the community are comfortable with the quality of Lodi's water and feel that chlorination is not necessary.

D. COMMENTS BY THE PUBLIC ON NON-AGENDA ITEMS

None.

E. ADJOURNMENT

No action was taken by the City Council. The meeting was adjourned at 8:05 a.m.

ATTEST:

Susan J. Blackston
City Clerk

City of Lodi, Public Works Department

Water System Bacteriological Compliance Summary

Year	# Months in Violation	Month(s) of Violation(s)	Total Coliform % positive (5% allowed)	Chlorination Events	Fecal Coliform Positives
2001	0			Jul.16-31 (NE Lodi only)	0
2000	0			none	0
1999	0			Jan.11-Feb.2, Nov.1-23	0
1998	1	February	6.1%	Mar. 3 - 27, Nov.17-Dec.2, Dec 26 (NE Lodi only)	0
1997	0			Jan.13-20, May 16-Jun. 2	0
1996	0			Jan.22-28	0
1995	0			none	0
1994	1	November	6.1%	December	0

Total Coliform Rule

When the news media announce a "boil water emergency," reporters often speak of a "total coliform violation." Coliforms are a group of bacteria, most of which are harmless. At first glance, it might seem strange that a harmless group of bacteria such as coliforms could cause such commotion. But like police tape and chalk outlines, coliform bacteria are often found at the scene of a crime even though they are not themselves criminals.
There are a variety of bacteria, parasites, and viruses which can cause immediate (though usually not serious) health problems when humans ingest them in drinking water. Testing water for each of these germs would be difficult and expensive. Instead, water quality and public health workers measure coliform levels. The presence of any coliforms in drinking water suggests that there may be disease-causing agents in the water.

The **Total Coliform Rule** (published 29 June 1989/effective 31 December 1990) set both health goals (MCLGs) and legal limits (MCLs) for total coliform levels in drinking water. The rule also details the type and frequency of testing that water systems must do.
The coliforms are a broad class of bacteria which live in the digestive tracts of humans and many animals. The presence of coliform bacteria in tap water suggests that the treatment system is not working properly or that there is a problem in the pipes. Among the health problems that contamination can cause are diarrhea, cramps, nausea and vomiting. Together these symptoms comprise a general category known as gastroenteritis. Gastroenteritis is not usually serious for a healthy person, but it can lead to more serious problems for people with weakened immune systems, such as the very young, elderly, or immuno-compromised.

In the rule, EPA set the health goal for total coliforms at zero. Since there have been waterborne disease outbreaks in which researchers have found very low levels of coliforms, any level indicates some health risk. (Health goals are non-enforceable.)

EPA also set a legal limit on total coliforms. Systems must not find coliforms in more than five percent of the samples they take each month to meet EPA's standards. If more than five percent of the samples contain coliforms, water system operators must report this violation to the state and the public.

When a system finds coliforms in drinking water, it may indicate that the system's treatment system is not performing properly. To avoid or eliminate microbial contamination, systems may need to take a number of actions, including repairing the disinfection/filtration equipment, flushing or upgrading the distribution system, and enacting source water protection programs to prevent contamination.

If a sample tests positive for coliforms, the system must collect a set of repeat samples within 24 hours. When a routine or repeat sample tests positive for total coliforms, it must also be analyzed for fecal coliforms and Escherichia coli (E. coli), which are coliforms directly associated with fresh feces. A positive result to this last test signifies an acute MCL violation, which necessitates rapid state and public notification because it represents a direct health risk. The number of coliform samples a system must take depends on the number of customers that it serves. Systems which serve fewer than 1000 people may test once a month or less frequently, while systems with 50,000 customers test 60 times per month and those with 2.5 million customers test at least 420 times per month. These are minimum schedules, and many systems test more frequently.

Definition: Total Coliforms are a group of closely related, mostly harmless bacteria that live in soil and water as well as the gut of animals. The extent to which total coliforms are present in the source water can indicate the general quality of that water and the potential that the water is fecally contaminated. Total coliforms are currently controlled in drinking water regulations (i.e., Total Coliform Rule) because their presence above the standard indicates problems in treatment or in the distribution system. EPA requires all water systems to monitor for total coliforms in distribution systems. If total coliforms are found, then the public water system must further analyze that total coliform-positive sample to determine if specific types of coliforms (i.e., fecal coliforms or *E. coli*) are present.

The coliform group consists of several genera of bacteria belonging to the family Enterobacteriaceae. The historical definition of this group has been based on the method used for detection (lactose fermentation) rather than on the tenets of systematic bacteriology. Accordingly, when the fermentation technique is used, this group is defined as all aerobic and facultative anaerobic, Gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48h at 35°C.

The standard test for the coliform group may be carried out either by the multiple-tube fermentation technique (through the presumptive-confirmed phases or completed test), by the membrane filter (MF) technique, or by the chromogenic substrate coliform test. Each technique is applicable within the limitations specified and with due consideration of the purpose of the examination.

During the test for the presence/absence of fecal coliforms the water is incubated with the appropriate media. After 24 hours, there are three possible results. If the sample appears unchanged, there are no coliform bacteria present. If the sample turns yellow, it indicates the presence of coliform bacteria. The third possibility occurs when the sample is exposed to an ultraviolet lamp. If the sample fluoresces, it indicates that there is *Escherichia coli* , a fecal coliform, is present as part of the total coliform.

Why use coliforms to indicate water quality?

Drinking water must be free of disease-causing organisms called pathogens. Pathogens can be viruses, protozoa or bacteria. Waterborne pathogens cause diseases such as hepatitis, giardiasis, and dysentery. To actually test water for specific harmful viruses, protozoa and bacteria is very time consuming and expensive. In addition, not all water laboratories are equipped and approved to do the testing required. Therefore, testing water for specific organisms is limited to investigating specific waterborne disease outbreaks. Coliform bacteria are used as water quality indicators for two main reasons:

- Coliforms may be associated with the sources of pathogens contaminating water.
- The analysis of drinking water for coliforms is relatively simple, economical and efficient.

;TATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

)EPARTMENT OF HEALTH SERVICES
;OUTHERN CALIFORNIA BRANCH
)RINKING WATER FIELD OPERATIONS
·1 E. CHANNEL STREET, ROOM 270
;TOCKTON, CALIFORNIA 95202
209) 948-7696
'AX (209) 948-7451

October 31, 2001

Dixon Flynn
City Manager
City of Lodi
P.O. Box 3006
Lodi, CA 95241

COMPLIANCE ORDER NO. 03-10-01CO-002 CORRECTION SHEET

Enclosed is a corrected copy of Page 6 of Compliance Order No. 03-10-01CO-002. It was discovered that the version of Page 6 that was mailed to you under cover of the Department's letter of October 25, 2001, had an error in Item No. 2 of the "Order" section the Compliance Order, on Page 6.

I regret any inconvenience to the City resulting from this error.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

cc: Richard Prima, City Engineer
Fran Forkas, Water/Wastewater Superintendent
Richard Haberman

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violated, and has not implemented appropriate corrective measures to abate violations of Sections 64426.1(b)(1), Chapter 15, Division 4 of Title 22 of the California Code of Regulations.

ORDER

Pursuant to Section 116655 of the California Health and Safety Code (CHSC), the Department hereby orders Respondents, the City of Lodi to do the following, to bring the water system into compliance with all applicable drinking water standards:

1. By January 1, 2002, all of the water produced by the City shall be chlorinated on a continuous basis to achieve and maintain a chlorine residual of 0.5 to 0.7 mg/L throughout the distribution system and in the storage tanks at all the times. The City shall submit a plan and schedule to the Department, which will achieve implementation of the required chlorination by this date. This plan should include appropriate distribution system flushing in conjunction with the initiation of chlorination.

2. By January 31, 2002, the City shall submit a plan and schedule, for approval by the Department, for implementation of the remaining recommendations in Section 1.2, Recommendations, of the Bacteriological Water Quality Study prepared for the City of Lodi by Boyle Engineering Corporation, and submitted to the Department on October 5, 2001, pursuant to the requirements of Citation No. 03-10-01C-005.

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 E. CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696
FAX (209) 948-7451

October 25, 2001

Dixon Flynn
City Manager
City of Lodi
P.O. Box 3006
Lodi, CA 95241

RECEIVED
OCT 26 2001

TRANSMITTAL OF COMPLIANCE ORDER NO. 03-10-01CO-002

In 1998, the Department of Health Services issued Citation No. 03-10-98C-002 to the City of Lodi, as operator the City of Lodi domestic water system, for violation of the Total Coliform Rule. In responding to that violation, the City stated that a biofilm on the inside of the water distribution system lines was the probable cause of the violation. Therefore, Citation No. 03-10-98C-002, dated March 23, 1998, directed the City to prepare and submit a Distribution System Biofilm Control Plan for controlling or eliminating the biofilms activity in the City's water distribution system.

Although the City hired a consultant to study its water system and make recommendations relevant to the biofilms growth in its distribution system, the City failed to provide the Department with the findings of the study, once completed. Therefore, the Department issued Citation No. 03-10-01C-005 in August of 2001 in response to this failure to comply with the previous directive.

The Department received the report presenting the results of the Bacteriological Water Quality Control Study under cover of a letter dated October 5, 2001. Based on the findings set forth in the study, the Department prepared Compliance Order No. 03-10-01CO-002, directing the City to implement the recommendations set forth in the study in order to control the microbiological activity that is prevalent in the City's water distribution system. The compliance order is being transmitted to the City under cover of this letter. Please respond to the order by the

deadlines established with each item. If you have any questions regarding this matter, please contact me at (209) 948-3816.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

cc: Richard Prima, City Engineer
✓Fran Forkas, Water/Wastewater Superintendent
Richard Haberman

Certified Mail No. 7000 1670 0008 5533 9668

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COMPLIANCE ORDER NO. 03-10-01CO-002

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

IN RE: **City of Lodi**
1331 South Ham Lane
Lodi, CA 95242

TO: Dixon Flynn
City Manager

ORDER TO CORRECT NONCOMPLIANCE - WATER SYSTEM NO. 3910004

FINDINGS OF FACT

The City's domestic water supply system is operated by the Public Works Department under authority of a water supply permit granted by the Department in May 1995 and its amendment dated July 31, 1997. The City serves un-chlorinated groundwater obtained from 24 active wells located within the service area. Six of the wells are equipped with Granular Activated Carbon (GAC) treatment systems for the removal of organic chemical contamination that occurs at levels that exceed primary maximum contaminate levels (MCLs). As of December 31, 2000 the City served a monthly population of about 57,935 via 17,031 service connections.

In accordance with Table 64423-A, Title 22, California Code of Regulations (CCR), the City examines at least 15 samples each week from its distribution system for

bacteriological contamination. All bacteriological samples are analyzed by the City's Wastewater Treatment Plant Laboratory, which is certified for such analyses by the State Environmental Laboratory Accreditation Program (hereinafter ELAP).

During February of 1998, the City completed examination of 72 routine samples for bacteriological contamination. Five of these samples tested positive for total coliform bacteria, although all were fecal negative. Fifteen repeat samples were collected in response to these positives samples. Ten of the 15 repeat samples tested negative for coliform and the remaining five samples were reported as invalid by the City's laboratory. Information provided by the Laboratory Director indicated that one of the five replacement samples for these invalid samples, collected on March 2nd, tested total coliform positive, fecal negative (Water Tower sample site) and the remaining four replacement samples tested negative for coliform contamination. All repeat samples for the March 2nd total coliform positive sample at the Water Tower Sample Site, collected on March 5th, tested negative for coliform bacteria.

Occurrence of 5 positive samples out of 82 total samples (6.1 percent total coliform positive) during the month of February 1998, resulted in failure to comply with the primary standard for bacteriological quality, (not to exceed 5.0 percent positive for total coliform when 40 or more samples are taken per month), specified in Section 64426.1(b)(1), Chapter 15, Title 22, CCR. Therefore, the City was in violation of Section 116555(a) of the California Health and Safety Code (CHSC).

After being notified by the analyzing (City) laboratory of the positive test results that produced the total coliform MCL failure for the month of February 1998, the City

contacted the Department by telephone and subsequently submitted to the Department a report of Possible Significant Rise in bacterial count (PSR report) dated March 4, 1998, as required in Section 64426, Title 22, CCR. The City's PSR report states, "A review of the physical works, operating procedures, and locations of the positive monitoring results point to the probable source of the positive samples to be a biofilm on the inside of the water distribution system water lines. The City has tried to chlorinate the system when needed to avoid total coliform-positive violations (emphasis added)".

Twenty-eight out of 72 routine samples or 38 percent of the routine samples collected in the month of February 1998 were reported invalid by the laboratory. The City has a long history of coliform sample invalidations. Prior to 1995, the City considered all invalid samples as negative for coliform contamination. In a citation issued in December 1994, the Department required all turbid cultures in the presumptive stage to be declared invalid and required replacement samples to be examined. Since, April 1997, the percentage of routine samples invalidated each month have ranged from 15 to 57 percent, with an **average of 37 percent routine invalidations per month**. These invalidation numbers are unusually high and similar problems have not been experienced for any other systems using the multiple fermentation tube (MFT) technique within the entire Central California Region. **In one instance, the City collected replacement samples 22 times before breaking the repeating invalidation cycle and obtaining reportable results**.

Frequent and repeated replacement of samples prolongs the determination of the microbial safety of the public water supply. Such delays may allow unacceptable health risks associated with hazards such as cross-connection contamination or microbial contamination to go undetected. Generally, water systems that have had invalidation problems with the MFT technique have converted to other acceptable microbiological analysis techniques that do not produce invalid results. Other utilities also quickly address identified biofilm problems by flushing and continuously chlorinating their water

supply systems.

Microbiological growth that causes cloudiness in samples being evaluated for bacteriological water quality has remained a problem in the examination of water samples collected from the Lodi distribution system for many years and remains a serious problem today. The average rate of invalidation of bacteriological samples in the year 2000 was 26 samples per month. Data for the first 9 months of 2000 show an average rate of invalidation of bacteriological samples of 25 samples per month. These data show that the City's invalidation numbers remain unusually high.

In the recent past, the City has implemented a plan to chlorinate the system when needed to avoid total coliform-positive violations. This plan implements the City's strategy of "trying to chlorinate the system when needed to avoid total coliform violations". The City presented this strategy in its PSR report, dated March 4, 1998. The need for chlorination is based on the threat of Total Coliform Rule failures that increase as the number of total coliform positive results approaches the MCL each month. Generally, in response to those threats, the City practices chlorination at specific sites in the distribution system where monitoring indicates that increased microbiological activity is occurring.

Because of the interference experienced in bacteriological monitoring using the MTF method, unusually frequent invalidation of samples due to turbidity in the cultures and an MCL violation, the City of Lodi was issued Citation No. 03-10-98C-002 in March 1998. That citation directed the City of Lodi to submit a Distribution System Biofilm Control Plan (DSBC plan) to the Department. The City of Lodi, violated the directive issued by the Department of Health Services in Citation No. 03-10-98C-002 by failing to submit such a plan. Subsequently, the Department issued Citation No. 03-10-01C-005 in August of 2001 in response to this violation (failure to submit the required report).

In response to Citation No. 03-10-01C-005, the City of Lodi submitted a draft of the Bacteriological Water Quality Study by Boyle Engineering Corporation to the Department

with a cover letter dated October 5, 2001. The report contains several conclusions, including the conclusion that, "The waters produced by the various wells are currently not being chlorinated in a significant manner on an ongoing basis." The report also recommends measures that the City should implement to improve the bacteriological quality of the water served to its water customers. Measures related to well construction and maintenance, Granular Activated Carbon (GAC) treatment facilities, distribution system storage facilities, distribution system sampling, and general topics related to bacteriological water quality are among the recommendations. The Boyle Report states that it should not be concluded that making the recommended corrections and improvements related to the construction and maintenance of the City's wells will not lead to significant improvements in the bacteriological quality of the **water produced by the various wells**. The City's cover letter states that the study found no major deficiencies that once corrected would ensure a marked difference in the bacterial quality of the water. While the City's interpretation may be relevant when considering the source water produced by the wells, it ignores the most significant recommendation documented in the Boyle Report, a recommendation that focuses on the quality of the water served to the Lodi water customers through the distribution system. The Boyle Report's most significant recommendation is that chlorination of the water entering the distribution system is essential to control the microbiological activity that is prevalent **in the City's distribution system**. This recommendation, when implemented with the remaining recommendations, will significantly improve the bacteriological water quality of the "water delivered to system customers" and improve the City's ability to restore timeliness to the monitoring of the bacteriological quality of the water in the distribution system.

CONCLUSIONS OF LAW

Based on the above Findings of Fact, the Department finds that the City of Lodi has

violated, and has not implemented appropriate corrective measures to abate violations of Sections 64426.1(b)(1), Chapter 15, Division 4 of Title 22 of the California Code of Regulations.

ORDER

Pursuant to Section 116655 of the California Health and Safety Code (CHSC), the Department hereby orders Respondents, the City of Lodi to do the following, to bring the water system into compliance with all applicable drinking water standards:

1. By January 1, 2002, all of the water produced by the City shall be chlorinated on a continuous basis to achieve and maintain a chlorine residual of 0.5 to 0.7 mg/L throughout the distribution system and in the storage tanks at all the times. The City shall submit a plan and schedule to the Department, which will achieve implementation of the required chlorination by this date. This plan should include appropriate distribution system flushing in conjunction with the initiation of chlorination.

2. By January 31, 2001, the City shall submit a plan a plan and schedule, for approval by the Department, for implementation of the remaining recommendations in Section 1.2, Recommendations, of the Bacteriological Water Quality Study prepared for the City of Lodi by Boyle Engineering Corporation, and submitted to the Department on October 5, 2001, pursuant to the requirements of Citation No. 03-10-01C-005.

The Department reserves the right to make such modifications to this Order as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be effective upon issuance.

All submittals required by this Order shall be addressed to:

Joseph O. Spano
District Engineer
Drinking Water Field Operations Branch
31 E. Channel Street, Room 270
Stockton, California 95202

If Respondents are unable to perform the tasks specified in this Order for any reason, whether within or beyond Respondents' control, and if Respondents notify the Department in writing no less than fifteen days in advance of the due date, the Department may extend the time for performance if Respondents demonstrate that they have used their best efforts to comply with the schedules and other requirements of this Order. If Respondents fail to perform any of the tasks specified in this Order by the time prescribed herein or by the time as subsequently extended pursuant to this paragraph, Respondents shall be deemed to have not complied with the obligations of this Order and may be subject to additional judicial action including civil penalties specified in the Health and Safety Code, Section

116725.

The Department shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by the Respondents, its employees, agents or contractors in carrying out activities pursuant to this Order, nor shall the Department be held as a party to any contract entered into by the Respondents or its agents in carrying out activities pursuant to this Order.

By issuance of this Order, the Department does not waive any further enforcement action.

PARTIES BOUND

This Order shall apply to and be binding upon the Respondents, its officers, directors, agents, employees, contractors, successors, and assignees.

SEVERABILITY

The requirements of this Order are severable, and Respondents shall comply with each and every provision thereof, notwithstanding the effectiveness of any other provision.

CIVIL PENALTIES

Subparts (c) and (e) of Section 116650 of the CHSC provide for assessing an administrative civil penalty for violation of the requirements of Chapter 7. Failure to comply with any provision of this order will result in the Department imposing an administrative penalty not to exceed two hundred dollars fifty dollars ($250) per day as of the date of violation of any provision of this order.

10-25-01
Date

Richard Haberman, P.E., Chief
Central California Section
Southern California Branch
DRINKING WATER FIELD OPERATIONS

A:\3910004\ Chlorination Compliance Order.1001

CITY OF LODI

PUBLIC WORKS DEPARTMENT

CITY HALL, 221 WEST PINE STREET
P.O. BOX 3006
LODI, CALIFORNIA 95241-1910
(209) 333-6706
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EMAIL pwdept@lodi.gov
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October 5, 2001

California Department of Health Services
Drinking Water Field Operations Branch, Stockton District
Attention: Mr. Joseph Spano, District Engineer
31 East Channel Street, Room 270
Stockton, CA 95202

SUBJECT: Additional Responses to Citation No. 03-10-01C-005

Per our discussion at the August 31, 2001 meeting and your September 23, 2001 letter, enclosed is a draft of the Bacteriological Water Quality Study by Boyle Engineering.

The study found no major deficiencies that once corrected would ensure a marked difference in bacterial quality of the water. The detailed biofilm study element of the scope of work was never performed, because, in the opinion of the consulting engineer, it was not felt necessary. We certainly hope that this detailed investigation of Lodi's water system regarding bacteriological factors will satisfy Citation No. 03-10-01C-005. Please review the study and send comments back to the City as you feel necessary.

Concerning the laboratory procedures for coliform bacteria analysis, the City has initiated the analysis procedure per your September 26, 2001 letter (enclosed). Each month the bacteriological sampling reports will be sent to your office and the results can be reviewed by your office. At the end of the 6-month period mentioned in your letter, the City will continue the analysis procedure outlined in your September 26, 2001 letter unless another procedure is agreed upon.

If you have any questions or comments, please contact me at (209) 333-6740.

Frank Beeler
Assistant Water/Wastewater Superintendent

FB/fb
Enclosures

cc: Richard C. Prima, Jr., Public Works Director
Fran E. Forkas, Water/Wastewater Superintendent
Michael Schafer, Laboratory Services Supervisor
Mr. Richard Haberman, P.E., Department of Health Services, Drinking Water Field Operations
1040 East Herndon Avenue, Suite 205, Fresno, CA 93720-3158
(include copy of draft study)

STATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 E. CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
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September 26, 2001

Frank Beeler
City of Lodi
221 W. Pine Street, PO Box 3006
Lodi, CA 95241-1910

RESPONSE TO CONCERNS REGARDING CITATION NO. 03-10-01C-005

The Department has received your letter of September 6, 2001, regarding the meeting of August 31, 2001, during which the provisions of Citation No. 03-10-01C-005 were discussed. Thank you and Mr. Schafer for sharing your views on the topics addressed in the referenced citation.

With respect to the comprehensive evaluation of the problems the City experiences with biofilms and a plan for controlling the biofilm in the Lodi distribution system, the Department looks forward to receiving the report prepared by your consultant regarding this issue. Data submitted by the City seem to indicate that the City is not nearly as opposed to chlorination as you indicate. The data suggest that the City utilizes chlorination as needed to avoid failures of the Total Coliform Rule (TCR). That suggests that the City acknowledges the value of chlorination in controlling the growth of microbiological organisms in its distribution system, but only exercises such control to the extent necessary to avoid TCR violations, rather than making a best effort to control growth at all times.

Although the meeting was conducted on August 31, the Department has not yet received the report relevant to comprehensive distribution system evaluation and the control of microbial growth that is evident in the City's distribution system, based on the microbial monitoring that the City performs each week. If the report is not received by the Department by November 1, 2001, a citation with an administrative penalty will be issued to the City. In submitting the report, please submit one copy to the Stockton District office for my review and a duplicate copy to the Fresno Regional office for review by Mr. Haberman.

With respect to the submission of monitoring reports, it was agreed that for monitoring, other than microbiological monitoring, conducted in any month, the City will accumulate and evaluate the results in the month following the collection of samples. Subsequently, by the tenth of the month following that

month in which data accumulation and evaluation is completed, the City will submit all data to the Department's Stockton District office.

Your letter of September 6, 2001, included the statement, "Mr. Haberman commented to the effect that many reports come in much later than Lodi's, and he did not seem to have a problem with the current arrangement". My notes indicate that Mr. Haberman was in agreement with the 70 day turn around time, and did not promote a more lengthily data reporting cycle. Follow-up discussions with Mr. Haberman confirms that he supports the 70 day turn-around time and had no intention to indicate otherwise.

At the meeting it was agreed that the City will initiate a 6-month monitoring program in which bacteriological samples will be evaluated according to the Multiple Tube Fermentation (MTF) technique. During that program, the City will transfer samples with growth in the presumptive stage, with no gas production, to the confirmed stage. Any positive results that occur during the confirmed stage will be considered positive for total coliform and reported as such. Those samples that do not produce positive results in the confirmed stage will be considered negative for total coliform and reported as such. No samples will be invalidated. As required in the MTF technique, the required number of samples will be processed through the completed phase of the test. Our Department firmly believes that once the corrective measures are outlined in the requested distribution system evaluation referred to in the 2nd paragraph of this letter, the coliform monitoring problems experienced by the City will be corrected also.

Please assure that the delivery of the copies of the report regarding the microbial growth problems in the City's distribution system to the Department are expedited. Also inform me of your thoughts relevant to the coliform testing at your earliest convenience. If you have any questions, contact me at 948-3816.

Joseph O. Spano

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

A:\3910004\Lodi Follow-up Letter-Citation 03-10-01C-005-Fnl.901

CITY OF LODI

PUBLIC WORKS DEPARTMENT

CITY HALL, 221 WEST PINE STREET
P.O. BOX 3006
LODI, CALIFORNIA 95241-1910
(209) 333-6706
FAX (209) 333-6710
EMAIL pwdept@lodi.gov
http:\\www.lodi.gov

September 6, 2001

California Department of Health Services
Drinking Water Field Operations Branch, Stockton District
Attention: Mr. Joseph Spano, District Engineer
31 East Channel Street, Room 270
Stockton, CA 95202

SUBJECT: Reply to Citation No 03-10-01C-005

Your office issued enclosed Citation No. 03-10-01C-005, dated August 6, 2001, to the City of Lodi drinking water system.

On Friday, August 31, 2001, you, Supervising Sanitary Engineer Richard Haberman and Sanitary Engineer Tahir Mansoor met with City Laboratory Services Supervisor Michael Schafer and me in your office. We discussed the directives contained in the above citation. Below is a discussion of the Directives as numbered in the citation and a summary of the outcome of our discussions at the above meeting.

1. The City agrees that this item from a previous directive has not been adequately responded to by the City of Lodi. We have experienced some frustration in getting this item addressed. There were no applicable references found or any similar type studies located to give City staff adequate direction. Eventually it was decided to have a consulting firm do an evaluation of the entire drinking water system. The consultant spoke with you before completing the evaluation's scope of work (enclosed). The scope of work included a biofilm element, which we envisioned would address your directive.

   While the comprehensive evaluation of the drinking water system was conducted, the consultant determined that a detailed evaluation of the biofilm was not necessary. A final draft of the study will be forwarded to you for your review. As discussed in our meeting, this comprehensive system evaluation should comply with the intent of the citation's directive.

2. There was agreement that the regulations read that reports received by the water supplier in a calendar month are to be reported to the Department by the tenth day of the following month. The City currently waits until all laboratory reports of monitoring for a calendar month are received. Thereafter, all

laboratory reports for that month are sent to your office along with a cover letter detailing the sampling activities for each well and other pertinent details concerning sampling results and sampling frequencies. There are also two summaries included that also accompany the letter, which summarize laboratory results. The City concedes that the reports sometimes exceed the above timeframe, but we feel it is important to take the time to track analyses and compliance for each well and constituent for the benefit of the City and the Department. Any monitoring results that cause an exceedance of regulations or other triggers were handled by a phone call and/or fax to your office. You agreed there have been no reporting problems resulting from the previous arrangement. Mr. Haberman commented to the effect that many reports come in much later than Lodi's, and he did not seem to have a problem with the current arrangement.

The meeting ended with our offer to try and meet the timeframe in the regulations cited above in the sense that reports for a month are generally received in the following calendar month therefore results will try and be reported by the tenth of the following month (i.e., January analyses will try and be summarized and reported by the tenth of March, unless any individual result triggers a quicker response to your office).

(Currently the City has not received all laboratory results for samples taken in July 2001. For all analyses received in September for the July samples, regulations dictate that we only get them to your office by the tenth of October. The City will not wait, but will summarize results then send in all July sampling reports as soon as we can.)

3. The laboratory procedures for coliform bacteria were discussed at some length. There is some ambiguity in federal regulations compared to the federally approved "Standard Methods", which dictates the procedures for approved laboratory analyses. The directive to submit presumptive non-gas forming tubes in Multiple-Tube Fermentation Technique to the confirmed stage, and thereafter invalidate and resample would cause an extra two days' delay for any resampling.

   You requested that Lodi should invalidate at the presumptive stage, resample and continue the tubes to the confirmed stage. This would result in two concurrent samples being performed on one reportable sampling event. We stated that this certainly is neither the intent of nor a valid interpretation of regulations.

   Mr. Haberman concluded by saying Lodi should transfer samples with no gas formation, yet have growth in the presumptive stage, to the confirmed stage. If there are any positive results from the confirmed stage, they will be considered positive for total coliform and be reported as positive. If there are no positive results in the confirmed stage, the results would be considered negative for total coliform bacteria, be reported as such and not be invalidated.

Recapping the actions we will follow: First, we have contacted Boyle Engineering, who is preparing final drafts of the drinking water system evaluation study, and we will forward a copy to your office. Second, we will continue with analytical results reporting procedures as outlined in #2 above. Third, we will continue to invalidate samples at the presumptive stage and perform Coliert on the replacement samples (current procedure) until we get confirmation in writing from your office to proceed as directed by Mr. Haberman in #3 above.

If you have any questions or comments, please contact me at (209) 333-6740.

Frank Beeler
Assistant Water/Wastewater Superintendent

FB/fb
Enclosures

cc: Richard C. Prima, Jr., Public Works Director
Fran E. Forkas, Water/Wastewater Superintendent
Michael Schafer, Laboratory Services Supervisor
Mr. Richard Haberman, P.E., Department of Health Services, Drinking Water Field Operations
1040 East Herndon Avenue, Suite 205, Fresno, CA 93720-3158

STATE OF CALIFORNIA–HEALTH AND HUMAN SERVICES AGENCY

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 EAST CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696 FAX (209) 948-7451

06 August 2001

Fran E. Forkas
Water/Wastewater Superintendent
City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TRANSMITTAL OF CITATION NO. 03-10-01C-005

The City of Lodi, operating the City of Lodi domestic water system, violated a directive issued by the Department of Health Services in Citation No. 03-10-98C-002. The Department has issued Citation No. 03-10-01C-005 in response to this violation. The citation is being transmitted to the City of Lodi under cover of this letter.

Please respond to the directives by the deadlines established with each item. If you have any questions regarding this matter, please contact me at (209) 948-3816.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

Certified Mail No.: 7000 1670 0008 5533 9750

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT

IN RE: City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TO: Fran E. Forkas
Water/Wastewater Superintendent

CITATION No. 03-10-01C-005

CITATION FOR NONCOMPLIANCE: WATER SYSTEM NO. 3910004

Section 116650, Chapter 4 of Part 12 of Division 104 of the California Health and Safety Code (CHSC), authorizes the issuance of a citation for failure to comply with a requirement of Chapter 4 (California Safe Drinking Water Act), or any regulation, standard, permit, or order issued thereunder.

VIOLATIONS

The Department of Health Services, Division of Drinking Water and Environmental Management (hereinafter Department) hereby issues a citation to the City of Lodi (hereinafter City), Public Water System No. 3910004, for failure to comply with a directive contained in Citation No. 03-10-98C-002.

Specifically, the City failed to submit a Distribution System Biofilm Control Plan (DSBC plan) to the Department.

In accordance with Section 116650 of the CHSC, the above violation is classified as a continuing violation.

BACKGROUND

The City of Lodi is located approximately 10 miles north of the City of Stockton in San Joaquin County. The water system is owned and operated by the City of Lodi under authority of Water Permit No. 03-10-95P-005, granted by the Department on 12 May 1995, and its amendment (03-10-97PA-008) dated 31 July 1997.

The Lodi Water System serves a maximum population of approximately 57,000 people in the area via 16,753 service connections. The water supply is derived from twenty-four active groundwater wells located within the service area. Raw water from Wells 4R, 16, 18, 20, 22, and 23 is passed through granular activated carbon (GAC) filters prior to entering the distribution system. Beyond this, the City's water receives no additional treatment, with the exception of periodic chlorination and exposure to ultraviolet lamps.

Citation 03-10-98C-002 was issued on 23 March 1998 in response to the City's February 1998 violation of the Maximum Contaminant Level (MCL) for total coliform bacteria. In an effort to

encourage the City to investigate and address the source(s) of the bacteriological contamination, the Department issued a directive that required the City to:

> "Within 4 weeks of receipt of this citation, conduct a comprehensive evaluation of the biofilm problem that the City is experiencing and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than May 1, 1998."

The certified mail return receipt for this citation indicates that the City received this citation on 24 March 1998. The Department did not receive any further information regarding the required water system evaluation until June 1999, when the City sent a letter to the Department that included a copy of the "scope of services" for the study, which had yet to be performed. To this date the DSBC plan, which was due in April 1998, has not been submitted to the Department.

DIRECTIVES

The City of Lodi is hereby directed to:

1. Complete a comprehensive evaluation of the biofilm problem that the City has experienced and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than 30 September 2001.

   The evaluation, plan, and implementation schedule shall be submitted to the Department by 07 September 2001.

2. Submit all laboratory reports for analyses of drinking water samples to the Department within 45 days of the date of sampling, effective immediately. Laboratory results of any constituent(s) for which there is a storet code (or entry #) in the Write-On program must be reported on a Write-On form.

3. Submit bacteriological drinking water samples demonstrating growth without a positive gas or acid reaction in the presumptive phase of the multiple tube fermentation test to the

confirmed phase prior to invalidation of the sample. If there is no gas formation in the confirmed phase the sample shall then be invalidated. This is consistent with both the standard method for the multiple-tube fermentation technique and 40 Code Federal Regulations (CFR), Section 141.21(c)(2).

40 CFR 141.21(c)(2) states, "A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique)...." As specified in Standard Methods for Examination of Water and Wastewater, a drinking water sample showing turbidity without gas formation in the presumptive phase must be submitted to the confirmed phase to ensure that no total coliforms are detected. If the sample shows gas formation in the confirmed phase, the sample is considered to be positive. If the sample (showing turbidity without gas formation in the presumptive phase) does not show gas formation in the confirmed phase, it meets the criteria of 40 CFR 141.21(c)(2) and must be invalidated.

Beginning in September 2001, laboratory reports for bacteriological samples must verify that microbiological samples showing turbidity without gas formation in the presumptive phase of the multiple-tube fermentation test have been submitted to the confirmed phase before they are invalidated. Any such samples that produce gas in the confirmed stage shall be considered positive for total coliforms. Laboratory results for microbiological monitoring shall continue to be submitted to the Department on a monthly basis, along with the Monthly Summary of Distribution System Coliform Monitoring.

All submittals required by this citation shall be sent to:

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District
31 E. Channel Street, Room 270
Stockton, CA 95202

CIVIL PENALTIES

Section 116650(e)(3) of the CHSC allows for the assessment of a civil penalty for failure to comply with the requirements of the Safe Drinking Water Act. Failure to comply with any provision of this Citation may result in the Department imposing an administrative penalty of an amount not exceeding two hundred ($200) per day for each day the violation continues beyond the date specified for correction in the citation.

8-6-01
Date

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

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Certified Mail No.: 7000 1670 0008 5533 9750

Work Tasks

Boyle Engineering Corporation shall perform the following work tasks:

Task 1 – Project Kick-Off Meeting and Meeting with DHS

This task consists of meeting with City staff and to collect project-related information consisting of various water quality data, various maps and plans, recent DHS correspondence and reports, in-house prepared reports, and reports from other consultants if applicable to this project. This task also includes a separate meeting with the DHS Stockton District Engineer to solicit DHS input into the study and to obtain relevant DHS file information.

Task 2 – Evaluation of Well Sites

An evaluation of the well sites will be performed for possible HPC and coliform bacteria contamination problems. We will review and evaluate the following:

- Surface well construction features (including current methods of pump lubrication used)
- Subsurface well construction features
- Land uses within a 250-foot radius around each wellhead
- Site drainage conditions
- Bacteriological sampling results (if available) obtained directly from each well within the last 5-year period
- Sample collection and sample point flushing/disinfection procedures being used and well sample point evaluation
- Operations and maintenance practices – normal operations and after pump repairs

Photographs of significant sanitary hazards found will be taken and documented in the report.

Task 3 – Evaluation of GAC Treatment Plants

An evaluation of the GAC treatment plant facilities will be performed for possible HPC and coliform bacteria contamination problems. We will review and evaluate the following:

- Construction features of the treatment facility components.
- The routine day-to-day operations/maintenance practices provided.
- Bacteriological sampling results (if available) obtained from the water entering and leaving the individual treatment vessels. Also perform AOC testing to determine possible contribution by the GAC.
- The special operations/maintenance procedures used when contactors are unloaded and reloaded with fresh GAC and when other equipment repairs are conducted.

Photographs of significant sanitary hazards found will be taken and documented in the report.

Task 4 – Evaluation of Existing Chlorination Treatment Equipment at Well Sites

The existing gas chlorination treatment facilities will be reviewed and evaluated. We will also provide cost estimates for the replacement of the gas chlorination facilities using either bulk stored, 12.5% sodium hypochlorite feeding facilities or the installation of on-site sodium hypochlorite generators (making a 0.8% available chlorine solution). These cost estimates will be prepared for:

- Sites now having chlorine gas feeding facilities
- Sites currently having no chlorination treatment facilities

Equipment needs will include chlorine residual analyzers/recorders and housing for the chlorine feed, monitoring, and feed control facilities.

This task will provide the City with budget cost estimates for compliance with the currently proposed Groundwater Rule by EPA, which may require mandatory disinfection treatment for all groundwater wells for bacteria/virus control.

We will also determine the currently available chlorine contact time from the point of chlorine application to the first water consumer and provide opinions on whether these chlorine contact times will be adequate for compliance with the current draft requirements of the GDR.

Boyle will also review the applicability of using UV disinfection at the well sites and evaluate recent past trial operations using UV disinfection in the City water system.

Task 5 – Evaluation of Water Storage Sites

The existing water storage sites will be reviewed and evaluated for possible HPC/coliform bacteria contamination problems. We will review and evaluate the following:

- The physical condition of each facility and whether significant structural defects exist externally and on the roofs that might pose bacteriological contamination problems. Internal inspections will be made to the extent possible.

- Available bacteriological sampling data generated directly from samples collected historically from each water storage site. This will be done for the data generated since May 1996.

- Operations and maintenance procedures used (normal operations and after cleaning and repair episodes) will be reviewed and evaluated.

- Facility inlet/outlet arrangements will be reviewed as to providing good water circulation and water turnover. Possible water stagnation problems within storage units will be discussed.

- Current sampling procedures and sampling locations will be reviewed to determine whether they should continue to be used.

- Existing (DHS requested) Operations Plans will be reviewed and improvement recommendations will be provided as appropriate.

Photographs of significant defects will be made and documented in the report.

Task 6 – Review of Historical Bacteriological Test Results from Distribution System

The bacteriological sampling program in the distribution system will be reviewed and evaluated. We will review and evaluate the following:

- Test results (coliform/fecal coliform/HPC bacteria, chlorine residual, and physical quality) from all sampling locations in the distribution system generated historically for the last 10-year period. This will include coliform positive and "cloudy" samples later invalidated as well as the HPC bacteria samples.

- Each currently used sampling location will be inspected in the field.

- The bacteriological sample siting plan, including each upstream and downstream repeat sampling station.

- The laboratory methods used for initial, repeat, and replacement samples for coliform bacteria analyses, including quality control.

- Discussion of reasons/causes for past sample invalidations.

- The laboratory methods used for HPC bacteria analyses.

- Laboratory procedures to identify the type(s) of HPC bacteria found in the city water system.

- Water sample handling and transportation procedures used.

- Water sample collection procedures being used.
- The historical sample replacement occurrences (criticized by DHS) will be reviewed.
- Evaluate advantages of installing dedicated sampling stations.

Task 7 – Distribution System Evaluations

Various aspects of the distribution system will be evaluated. These aspects will be as follows:

- The status of the City's cross-connection control program.
- The status of the City's water main flushing program.
- The extent of the City's historical chlorination treatment program and the magnitude and type of chlorine residuals obtained during treatment periods.
- The presence of underground air/vacuum release valves on transmission mains.
- The general separation of water and sewer lines throughout the City's water system.
- The presence of dead ends and the degree of flushing provided.
- Allowing private contractors to connect to existing water system.

Task 8 – New and Repaired Water Main Considerations

The procedures by City staff used in installing, flushing, and sampling of new waterlines will be evaluated. The degree of City inspection/oversight during construction by contractors will also be reviewed. The procedures used in repairing existing water mains will be evaluated. This will be done for instances where water mains are repaired under pressure and for water mains that are first dewatered, repaired, and then repressurized. The repair procedures used, such as flushing, disinfection, and sampling, will be reviewed.

Task 9 – Biofilm Confirmation

Boyle staff will assist City staff to confirm the presence of a suspected "biofilm" on the inside surfaces of pipelines. This will be done to the extent possible using the following approaches:

- High-velocity flushing, water sampling, and concentrating the precipitates for later microscopic analyses
- Pigging of pipelines, water sampling, and concentrating the precipitates for later microscopic analyses
- Visual pipeline inspection at two or three locations where pipelines are being replaced, scraping of pipe deposit for later microscopic analyses

Task 10 – Adequacy of Operational Staff

The existing field staff will be evaluated for adequacy of training and operator certification. We will evaluate whether the current number of operators can adequately operate, maintain, and monitor the existing water system facilities in a sanitary manner.

This task will also provide recommendations for additional staff necessary to implement and maintain all recommended improvements as a result of this report.

Task 11 – Preparation of Draft Engineering Report and Internal Quality Control

The findings, conclusions, and recommendations generated by Tasks 1 through 10 will be documented in a draft report. A total of five copies of the draft report will be provided to the City for review and comments. Prior to submitting the draft report to the City, it will be reviewed for quality control purposes by Glenn McPherson, managing engineer of Boyle's Sacramento office.

Task 12 – Draft Report Review and Other Client Meeting

A meeting will be held with City staff to discuss the draft report and the City's draft report review comments. A final project meeting will be attended with City management staff. A project presentation meeting will be attended at a City Council meeting.

Task 13 – Preparation of Final Engineering Report

The final report will be prepared incorporating the City's draft report review comments. A total of ten final report copies will be provided to the City.

Task 14 – Optional Work Task – Two-Year Travel Time Calculations

Boyle will perform EPA/Source Water Assessment evaluations, namely to estimate the "Two-Year Zone of Contribution" for each well. This will be done using existing available information related to underground geology, hydrology, and subsurface well construction. Note: This work task was suggested to the City by the California Department of Health Services.

Task 15 – Optional Work Task – Procedures Manual for Work on City Water Mains by City Staff and Contractors

Boyle will meet with City staff to outline the Procedures Manual to be prepared. After a draft of the manual has been completed, Boyle staff will again meet with City staff to discuss the draft manual, then revise it and prepare the final Procedures Manual. The City will be supplied with one reproducible copy of the final manual.

STATE OF CALIFORNIA–HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 EAST CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696 FAX (209) 948-7451

06 August 2001

Fran E. Forkas
Water/Wastewater Superintendent
City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TRANSMITTAL OF CITATION NO. 03-10-01C-005

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Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

Certified Mail No.: 7000 1670 0008 5533 9750

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT

IN RE: City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TO: Fran E. Forkas
Water/Wastewater Superintendent

CITATION No. 03-10-01C-005

CITATION FOR NONCOMPLIANCE: WATER SYSTEM NO. 3910004

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DIRECTIVES

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Drinking Water Field Operations Branch
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31 E. Channel Street, Room 270
Stockton, CA 95202

CIVIL PENALTIES

Section 116650(e)(3) of the CHSC allows for the assessment of a civil penalty for failure to comply with the requirements of the Safe Drinking Water Act. Failure to comply with any provision of this Citation may result in the Department imposing an administrative penalty of an amount not exceeding two hundred ($200) per day for each day the violation continues beyond the date specified for correction in the citation.

8-6-01
Date

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

A:\Citation (3910004) 0801.doc
Certified Mail No.: 7000 1670 0008 5533 9750

Jennifer Perrin

From: David Vietmeier [maddog1@softcom.net]
Sent: Monday, November 12, 2001 11:41 AM
To: nakanishi@lodi.gov
Subject: chlorine issue

November 12, 2001

The Honorable Alan Nakanishi, Mayor

City of Lodi

Dear Sir,

I have been reasonably quiet since my friend and former Mayor, Steve Mann, left the council. Mr. Land is an acquaintance of mine but we don't see eye-to-eye on several issues. My closest connection was with Councilman Dave Warner. I'm sorry he is no longer representing us.

I read the newspaper account on the 8th, of the demands of the State regarding chlorine in our water. May I register my opposition? But, for possibly different reasons than others may conclude?

I am opposed to the State mandate because I believe it is founded on weak science, lack of investigation, poor management, and near stupidity. There's an old saw that says: Those who can do, those who can't teach. I include scientists in that category. Those who are brilliant don't work for the State. Of course, that is a generality. You won't need to remind me. The gist of the whole controversy is more than likely imbedded in politics, loose science, and perhaps a vendetta through the insurance industry, which will supposedly pony up and pay to clean the ground contamination (before it gets into the water) a fiasco the City has been waging for a long time. Has that issue been settled?

I am opposed to a State mandate because it IS a State mandate! If, as Councilman Land suggested, the City were doing more than the State requires to keep the water germ-free, then it would seem they have no leg to stand on.

So, I implore you and the Council to stand firm. Get a little "testy." Don't let Lodi become an annex of State Government bureaucrats by letting them run roughshod over us. We do not need the chlorine, we don't need the State meddlers, and we don't need lily-livered councilmen. Get tough on this issue.

Sincerely,

David Vietmeier

310 Cork Oak Way

Lodi, CA 95242

532 Tara Place
Lodi, California 95240
(209) 368-0753
November 12, 2001

RE: Chlorination of Lodi's water supply

Dear friends at the Lodi City Council,

We recently moved to Lodi upon our return to the good old USA after living for several years in Ontario, Canada. We really like Lodi. Our neighborhood is quiet and friendly, and we feel safe here. One of the things we have appreciated about the town of Lodi is its water. We like being able to drink directly from the tap when we want instead of having to filter the water so it tastes good enough to get down. We like knowing that additives are there only when actually necessary.

We read recently in the Lodi News-Sentinel that the state of California has ordered the city of Lodi to start chlorinating as of Jan. 1, 2002. Why? We understand using various chemicals to keep our people safe on a need by need basis, but when there is no need why subject us to unnecessary substances? And where will it end? Fluoridation? Extra Calcium supplementation? Antibiotics? . . .

Tobias's father ran the water system of a rural town in Arkansas. That town had two wells. Its water was chlorinated but not fluoridated. We were plainly told by the state officials that chlorination was unnecessary for us, but state policy required it. The population of that town accepted. We hope Lodi can do otherwise.

Is there no way to continue the method Lodi already uses? We understand that the city is already carefully monitoring our 24 wells and already chlorinates if a test comes back positive for any pathogen or bacteria that requires remedial action.

We do understand there can be risks. Carelessness can put people's lives in danger. But that is true whatever the method of purification. Yes, there was the bad reading on that test several years ago. But the time since has shown that our City learned its lesson.

Lodi water, as it is currently, reduces the need for home filtration systems, encourages the health of the population by making good quality, good tasting drinking and cooking water readily available, and costs less to the city than a regular chlorination system would. We would like to see it kept that way.

Sincerely,

Tobias L. Stockler

Tobias L. Stockler

Mary L. Stockler

Mary L. Stockler

✓CC	__HR
✓CM	__IS
✓CA	__LIB
__CD	__PR
__EUD	__PD
__FIN	✓PW
__FD	__COM

Mayor's & Council Member's Weekly Calendar

WEEK OF NOVEMBER 13, 2001

Tuesday, November 13, 2001

7:00 a.m. Shirtsleeve Session
1. Water System Chlorination

8:00 - 12:00 p.m. **Howard.** Central Valley Wastewater Managers Association seminar on wastewater, Sacramento.

12:30 p.m. **Nakanishi.** Meeting with Lodi District Grape Growers, Lucas Winery.

6:00 p.m. **Nakanishi and Land.** Chamber's Leadership Lodi Graduation Dinner and Alumni Reunion, Elkhorn Country Club, Stockton. Dinner at 7:00 p.m.

7:00 p.m. **Nakanishi.** Boy Scout Troop 198 Court of Honor, Church of Jesus Christ of Latter-Day Saints.

Wednesday, November 14, 2001

11:30 - 1:00 p.m. Woolsey Oil, Inc. 9th Annual Customer Appreciation Days, 930 E. Victor Road.

11:30 - 1:30 p.m. Blue Cross of California celebration to honor its community partners, Brookside Country Club, Stockton.

Thursday, November 15, 2001

5:30 p.m. **Nakanishi and Howard.** Elm Street Pedestrian Mall Grand Opening and Ribbon Cutting.

Friday, November 16, 2001

4:00 - 8:00 p.m. **Nakanishi.** Retirement Open House for Roger Houston, Chief Building Inspector, Hutchins Street Square.

Saturday, November 17, 2001

Sunday, November 18, 2001

7:30 a.m. **Land and Pennino.** Celebration of the opening of COPIA - The American Center for Food, Wine and the Arts in Napa.

Monday, November 19, 2001

Filed 11-13-01

Council Shirtsleeve Presentation 11-13-01
Chlorination of Lodi Drinking Water System

California Department of Health Services (DHS)
The Permitting Agency for water systems like Lodi's
District office is located in Stockton, Regional office in Fresno

Present Situation – no regular Chlorination fo Lodi's drinking water,
Only when deemed necessary

DHS issued an Order on October 25, 2001 (and correction October 31, 2001)
To Chlorinate Lodi's Drinking Water System Full-time

How and why did this order come about?
Overview of situation
Council Packet –
Violation and directives from DHS, City responses,
and the order to chlorinate.
Background information on Coliform bacteria
(from U.S. EPA and other sources)

Where we test the drinking water system for compliance and how often.
Map of locations
Overhead of number of samples taken
Times Lodi exceeded the coliform limit since 1994.
Overhead of exceedance & chlorination history

City performs Coliform bacteria testing to meet DHS and U.S. EPA's standards

Total Coliform Rule –

What are coliforms (defined by test procedure)

Found in nature: soil, water, the intestinal tract of animals

Used for testing and meeting standards

as an indicator of possible contamination.

Changes made in November 1992 to compliance standards (much stricter)

Types of tests –

About five tests approved for use for total coliform

Lodi uses the Multiple-Tube Fermentation Technique and Colilert

Explanation and demonstrate

MTFT testing:

Presumptive and confirmed stages.

Colilert:

One step, no presumptive and no growth

We prefer the Multiple-Tube Fermentation Technique (MTFT)

Indicator of potential problems (presumptive stage)

Explanation: growth w/ no gas in presumptive, transferring, invalidations, no invalidations...

History in Lodi:

No transfer - prior to Apr. 11, 1994

Transfer - of growth/no gas started Apr. 18, 1994

Invalidation - resample w/ MTFT- started Dec 7, 1994

Invalidation - resample w/ Colilert- started May 6, 1998

Transfer - of growth/no gas started again in Oct, 2001

What else does Lodi do to protect the drinking water system.

New water main acceptance is more strict than State Standards:

Require more that just passing the total coliform test

A restriction on number of presumptive portions of a sample

Wells must meet stricter standards that the State allows:

Not only total coliform free but also NO PRESUMTIVE and NO Growth in samples.

Remedial actions are used on wells not passing Lodi's standards before the well is put on line.

Treatment systems (Granular Activated Carbon for DBCP) must meet stricter standards that the State allows:

Not only total coliform free but also NO PRESUMTIVE and NO Growth in samples

Remedial actions are used on GAC systems not passing Lodi's standards before the system is put on line.

Lodi has an approved Backflow Prevention Program that reduces the possibility that the distribution system can be contaminated from industries and other special hazards.

History starting with February 1998 exceedance of MCL for total coliforms:

6.1 % (5% acceptable) total coliform positives of all samples in month

Lodi reported as required

Violation issued March 13, 1998 directives included:

- Public Notice of Violation/Proof of Notification
- Comprehensive Evaluation of the biofilm problem and submit a biofilm control plan
- Analyze replacement samples with Colilert-type method
- <u>This was classified as a non-continuing violation</u>

The "comprehensive evaluation of the biofilm problem" directive turned out to be a difficult item. Lodi asked DHS Stockton to produce a similar document and resources detailing how to do such a study. DHS produced only industry studies concerning biofilm and bacteriological regrowth problems in chlorinated systems. The studies dealt mainly with what kinds of chlorine to use in systems under normal operating conditions and flushing conditions. There was no relevant studies/references produced by DHS to help us.

Finally City hired a consultant (Boyle Engineering) to conduct a comprehensive study of the water system and biofilm. The study took much longer than anticipated, and the consultant concluded that the Biofilm study was not needed. The City reviewed the study and wondered what to do.

DHS issued a citation dated August 6, 2001 for not turning in the (above) biofilm study. The Citation also directed the City to Invalidate Coliform samples with growth/no gas, resample, AND transfer the original sample to the second phase. Another directive was for the City Well Monitoring to be submitted to the Stockton office 45 days after any chemical analysis samples were taken.

August 31, 2001 the City met with Joe Spano, Stockton District Engineer and Rich Haberman, Chief, Central California Section of DHS.
Lodi agreed to:
-obtain and send a draft of the Boyle study,
-stop invalidating coliform bacti samples – transfer only (as pre-12/7/94)
-and continue to follow regulations for reporting times
(from 40 to 70 days before reporting)

Lodi submitted the draft Boyle study October 5,2001 with a cover letter asking them to review and comment on the draft.

With no further contact with DHS,

NEXT we received the 10/25/01 Chlorination order in the mail –

a total surprise and shock.

City of Lodi, Public Works Department

Water System Bacteriological Compliance Summary

Year	# Months in Violation	Month(s) of Violation(s)	Total Coliform % positive (5% allowed)	Chlorination Events	Confirmed Fecal Positives
2001	0			Jul.16-31 (NE Lodi only)	0
2000	0			none	0
1999	0			Jan.11-Feb.2, Nov.1-23	0
1998	1	February	6.1%	Mar. 3 - 27, Nov.17-Dec.2, Dec.26-1/11 (NE Lodi only)	0
1997	0			Jan.13-20, May 16-Jun. 2	0
1996	0			Jan.22-28	0
1995	0			none	0
1994	1	November	6.1%	December	0

Coliform Bacteria Testing Methods' Demonstration

Multiple Tube Fermentation Technique

1. Presumptive Stage Tube, no growth, negative
2. Presumptive Stage Tube, some growth
3. Presumptive Stage Tube, abundant growth
4. Presumptive Stage Tube, positive
5. Confirmed Total Coliform Tube, negative for Total Coliforms
6. Confirmed Total Coliform Tube, positive for Total Coliforms
7. Fecal Coliform Tube, negative for Fecal Coliforms
8. Fecal Coliform Tube, positive for Fecal Coliforms

Colilert Method (one set to be displayed)

9. Colilert, negative (absent)
10. Colilert positive for total coliform bacteria (present)
    (with UV light, fluorescence would indicate fecal coliform present)

	Since November 1992 New (Total Coliform Rule)	Pre November 1992 Old
Amount per sample	100 milliliters	50 milliliters
Type of analysis	Either absent from total or fecal coliforms, or if any portion is positive-coliform is present.	Set up 5 test-tubes with 10 milliliters sample in each test-tube.
Allowable Total Coliform Positives	cannot exceed 5% of all (reportable) samples with presence of coliforms	cannot exceed 10 % of all portions (test-tubes) nor exceed 5% of samples with 3 tubes positive
Allowable Fecal (or E. Coli) Coliform Positives	None allowed	NA

City of Lodi, Public Works Department
Water System Bacteriological Compliance Sampling

Through October 2001

Year	# Distribution Samples per Year			Notes:	Replacements for Invalidation Positives			
	Reportable Samples	Invalidation Resamples	Total Samples		Method	Repl. positives	% of reportable	% of repl.
2001 (10 mo.)	**821**	**222**	**1043**	Transfer of growth/ no gas started again October 1, 2001	Colilert	6	0.73%	2.70%
2000	**962**	**316**	**1278**		Colilert	2	0.21%	0.63%
1999	**979**	**186**	**1165**		Colilert	6	0.61%	3.23%
98 colilert only	733	232	965	Invalidation-resample w/Colilert started May 6, 1998	Colilert	3	0.41%	1.29%
1998	**999**	**339**	**1338**		MTFT	3	1.13%	2.80%
1997	**968**	**673**	**1641**		MTFT	5	0.52%	0.74%
1996	**999**	**393**	**1392**		MTFT	4	0.40%	1.02%
1995	**962**	**393**	**1355**		MTFT	3	0.31%	0.76%
1994	**984**	**32**	**1016**	Invalidation-resample w/ MTFT- started Dec 7, 1994				
				Transfer of growth/ no gas started Apr. 18, 1994				
				No transfer/invalidation prior to Apr. 11, 1994				

City of Lodi, Public Works Department

Water System Bacteriological Compliance Summary

Year	# Months in Violation	Month(s) of Violation(s)	Total Coliform % positive (5% allowed)	Chlorination Events	Fecal Coliform Positives
2001	0			Jul.16-31 (NE Lodi only)	0
2000	0			none	0
1999	0			Jan.11-Feb.2, Nov.1-23	0
1998	1	February	6.1%	Mar. 3 - 27, Nov.17-Dec.2, Dec 26 (NE Lodi only)	0
1997	0			Jan.13-20, May 16-Jun. 2	0
1996	0			Jan.22-28	0
1995	0			none	0
1994	1	November	6.1%	December	0

Total Coliform Rule

When the news media announce a "boil water emergency," reporters often speak of a "total coliform violation." Coliforms are a group of bacteria, most of which are harmless. At first glance, it might seem strange that a harmless group of bacteria such as coliforms could cause such commotion. But like police tape and chalk outlines, coliform bacteria are often found at the scene of a crime even though they are not themselves criminals.
There are a variety of bacteria, parasites, and viruses which can cause immediate (though usually not serious) health problems when humans ingest them in drinking water. Testing water for each of these germs would be difficult and expensive. Instead, water quality and public health workers measure coliform levels. The presence of any coliforms in drinking water suggests that there may be disease-causing agents in the water.

The **Total Coliform Rule** (published 29 June 1989/effective 31 December 1990) set both health goals (MCLGs) and legal limits (MCLs) for total coliform levels in drinking water. The rule also details the type and frequency of testing that water systems must do.
The coliforms are a broad class of bacteria which live in the digestive tracts of humans and many animals. The presence of coliform bacteria in tap water suggests that the treatment system is not working properly or that there is a problem in the pipes. Among the health problems that contamination can cause are diarrhea, cramps, nausea and vomiting. Together these symptoms comprise a general category known as gastroenteritis. Gastroenteritis is not usually serious for a healthy person, but it can lead to more serious problems for people with weakened immune systems, such as the very young, elderly, or immuno-compromised.

In the rule, EPA set the health goal for total coliforms at zero. Since there have been waterborne disease outbreaks in which researchers have found very low levels of coliforms, any level indicates some health risk. (Health goals are non-enforceable.)

EPA also set a legal limit on total coliforms. Systems must not find coliforms in more than five percent of the samples they take each month to meet EPA's standards. If more than five percent of the samples contain coliforms, water system operators must report this violation to the state and the public.

When a system finds coliforms in drinking water, it may indicate that the system's treatment system is not performing properly. To avoid or eliminate microbial contamination, systems may need to take a number of actions, including repairing the disinfection/filtration equipment, flushing or upgrading the distribution system, and enacting source water protection programs to prevent contamination.

If a sample tests positive for coliforms, the system must collect a set of repeat samples within 24 hours. When a routine or repeat sample tests positive for total coliforms, it must also be analyzed for fecal coliforms and Escherichia coli (E. coli), which are coliforms directly associated with fresh feces. A positive result to this last test signifies an acute MCL violation, which necessitates rapid state and public notification because it represents a direct health risk. The number of coliform samples a system must take depends on the number of customers that it serves. Systems which serve fewer than 1000 people may test once a month or less frequently, while systems with 50,000 customers test 60 times per month and those with 2.5 million customers test at least 420 times per month. These are minimum schedules, and many systems test more frequently.

Definition: Total Coliforms are a group of closely related, mostly harmless bacteria that live in soil and water as well as the gut of animals. The extent to which total coliforms are present in the source water can indicate the general quality of that water and the potential that the water is fecally contaminated. Total coliforms are currently controlled in drinking water regulations (i.e., Total Coliform Rule) because their presence above the standard indicates problems in treatment or in the distribution system. EPA requires all water systems to monitor for total coliforms in distribution systems. If total coliforms are found, then the public water system must further analyze that total coliform-positive sample to determine if specific types of coliforms (i.e., fecal coliforms or *E. coli*) are present.

The coliform group consists of several genera of bacteria belonging to the family Enterobacteriaceae. The historical definition of this group has been based on the method used for detection (lactose fermentation) rather than on the tenets of systematic bacteriology. Accordingly, when the fermentation technique is used, this group is defined as all aerobic and facultative anaerobic, Gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48h at 35°C.

The standard test for the coliform group may be carried out either by the multiple-tube fermentation technique (through the presumptive-confirmed phases or completed test), by the membrane filter (MF) technique, or by the chromogenic substrate coliform test. Each technique is applicable within the limitations specified and with due consideration of the purpose of the examination.

During the test for the presence/absence of fecal coliforms the water is incubated with the appropriate media. After 24 hours, there are three possible results. If the sample appears unchanged, there are no coliform bacteria present. If the sample turns yellow, it indicates the presence of coliform bacteria. The third possibility occurs when the sample is exposed to an ultraviolet lamp. If the sample fluoresces, it indicates that there is *Escherichia coli* , a fecal coliform, is present as part of the total coliform.

Why use coliforms to indicate water quality?

Drinking water must be free of disease-causing organisms called pathogens. Pathogens can be viruses, protozoa or bacteria. Waterborne pathogens cause diseases such as hepatitis, giardiasis, and dysentery. To actually test water for specific harmful viruses, protozoa and bacteria is very time consuming and expensive. In addition, not all water laboratories are equipped and approved to do the testing required. Therefore, testing water for specific organisms is limited to investigating specific waterborne disease outbreaks. Coliform bacteria are used as water quality indicators for two main reasons:

- Coliforms may be associated with the sources of pathogens contaminating water.
- The analysis of drinking water for coliforms is relatively simple, economical and efficient.

TATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY
GRAY DAVIS, *Governor*

)EPARTMENT OF HEALTH SERVICES
OUTHERN CALIFORNIA BRANCH
RINKING WATER FIELD OPERATIONS
1 E. CHANNEL STREET, ROOM 270
TOCKTON, CALIFORNIA 95202
:09) 948-7696
AX (209) 948-7451

October 31, 2001

Dixon Flynn
City Manager
City of Lodi
P.O. Box 3006
Lodi, CA 95241

COMPLIANCE ORDER NO. 03-10-01CO-002 CORRECTION SHEET

Enclosed is a corrected copy of Page 6 of Compliance Order No. 03-10-01CO-002. It was discovered that the version of Page 6 that was mailed to you under cover of the Department's letter of October 25, 2001, had an error in Item No. 2 of the "Order" section the Compliance Order, on Page 6.

I regret any inconvenience to the City resulting from this error.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

cc: Richard Prima, City Engineer
Fran Forkas, Water/Wastewater Superintendent
Richard Haberman

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violated, and has not implemented appropriate corrective measures to abate violations of Sections 64426.1(b)(1), Chapter 15, Division 4 of Title 22 of the California Code of Regulations.

ORDER

Pursuant to Section 116655 of the California Health and Safety Code (CHSC), the Department hereby orders Respondents, the City of Lodi to do the following, to bring the water system into compliance with all applicable drinking water standards:

1. By January 1, 2002, all of the water produced by the City shall be chlorinated on a continuous basis to achieve and maintain a chlorine residual of 0.5 to 0.7 mg/L throughout the distribution system and in the storage tanks at all the times. The City shall submit a plan and schedule to the Department, which will achieve implementation of the required chlorination by this date. This plan should include appropriate distribution system flushing in conjunction with the initiation of chlorination.

2. By January 31, 2002, the City shall submit a plan and schedule, for approval by the Department, for implementation of the remaining recommendations in Section 1.2, Recommendations, of the Bacteriological Water Quality Study prepared for the City of Lodi by Boyle Engineering Corporation, and submitted to the Department on October 5, 2001, pursuant to the requirements of Citation No. 03-10-01C-005.

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 E. CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696
FAX (209) 948-7451

October 25, 2001

Dixon Flynn
City Manager
City of Lodi
P.O. Box 3006
Lodi, CA 95241

TRANSMITTAL OF COMPLIANCE ORDER NO. 03-10-01CO-002

In 1998, the Department of Health Services issued Citation No. 03-10-98C-002 to the City of Lodi, as operator the City of Lodi domestic water system, for violation of the Total Coliform Rule. In responding to that violation, the City stated that a biofilm on the inside of the water distribution system lines was the probable cause of the violation. Therefore, Citation No. 03-10-98C-002, dated March 23, 1998, directed the City to prepare and submit a Distribution System Biofilm Control Plan for controlling or eliminating the biofilms activity in the City's water distribution system.

Although the City hired a consultant to study its water system and make recommendations relevant to the biofilms growth in its distribution system, the City failed to provide the Department with the findings of the study, once completed. Therefore, the Department issued Citation No. 03-10-01C-005 in August of 2001 in response to this failure to comply with the previous directive.

The Department received the report presenting the results of the Bacteriological Water Quality Control Study under cover of a letter dated October 5, 2001. Based on the findings set forth in the study, the Department prepared Compliance Order No. 03-10-01CO-002, directing the City to implement the recommendations set forth in the study in order to control the microbiological activity that is prevalent in the City's water distribution system. The compliance order is being transmitted to the City under cover of this letter. Please respond to the order by the

deadlines established with each item. If you have any questions regarding this matter, please contact me at (209) 948-3816.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

cc: Richard Prima, City Engineer
✓Fran Forkas, Water/Wastewater Superintendent
Richard Haberman

Certified Mail No. 7000 1670 0008 5533 9668

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COMPLIANCE ORDER NO. 03-10-01CO-002

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

IN RE: **City of Lodi**
1331 South Ham Lane
Lodi, CA 95242

TO: Dixon Flynn
City Manager

ORDER TO CORRECT NONCOMPLIANCE - WATER SYSTEM NO. 3910004

FINDINGS OF FACT

The City's domestic water supply system is operated by the Public Works Department under authority of a water supply permit granted by the Department in May 1995 and its amendment dated July 31, 1997. The City serves un-chlorinated groundwater obtained from 24 active wells located within the service area. Six of the wells are equipped with Granular Activated Carbon (GAC) treatment systems for the removal of organic chemical contamination that occurs at levels that exceed primary maximum contaminate levels (MCLs). As of December 31, 2000 the City served a monthly population of about 57,935 via 17,031 service connections.

In accordance with Table 64423-A, Title 22, California Code of Regulations (CCR), the City examines at least 15 samples each week from its distribution system for

bacteriological contamination. All bacteriological samples are analyzed by the City's Wastewater Treatment Plant Laboratory, which is certified for such analyses by the State Environmental Laboratory Accreditation Program (hereinafter ELAP).

During February of 1998, the City completed examination of 72 routine samples for bacteriological contamination. Five of these samples tested positive for total coliform bacteria, although all were fecal negative. Fifteen repeat samples were collected in response to these positives samples. Ten of the 15 repeat samples tested negative for coliform and the remaining five samples were reported as invalid by the City's laboratory. Information provided by the Laboratory Director indicated that one of the five replacement samples for these invalid samples, collected on March 2nd, tested total coliform positive, fecal negative (Water Tower sample site) and the remaining four replacement samples tested negative for coliform contamination. All repeat samples for the March 2nd total coliform positive sample at the Water Tower Sample Site, collected on March 5th, tested negative for coliform bacteria.

Occurrence of 5 positive samples out of 82 total samples (6.1 percent total coliform positive) during the month of February 1998, resulted in failure to comply with the primary standard for bacteriological quality, (not to exceed 5.0 percent positive for total coliform when 40 or more samples are taken per month), specified in Section 64426.1(b)(1), Chapter 15, Title 22, CCR. Therefore, the City was in violation of Section 116555(a) of the California Health and Safety Code (CHSC).

After being notified by the analyzing (City) laboratory of the positive test results that produced the total coliform MCL failure for the month of February 1998, the City

contacted the Department by telephone and subsequently submitted to the Department a report of Possible Significant Rise in bacterial count (PSR report) dated March 4, 1998, as required in Section 64426, Title 22, CCR. The City's PSR report states, "A review of the physical works, operating procedures, and locations of the positive monitoring results point to the probable source of the positive samples to be a biofilm on the inside of the water distribution system water lines. The City has tried to chlorinate the system when needed to avoid total coliform-positive violations (emphasis added)".

Twenty-eight out of 72 routine samples or 38 percent of the routine samples collected in the month of February 1998 were reported invalid by the laboratory. The City has a long history of coliform sample invalidations. Prior to 1995, the City considered all invalid samples as negative for coliform contamination. In a citation issued in December 1994, the Department required all turbid cultures in the presumptive stage to be declared invalid and required replacement samples to be examined. Since, April 1997, the percentage of routine samples invalidated each month have ranged from 15 to 57 percent, with an **average of 37 percent routine invalidations per month**. These invalidation numbers are unusually high and similar problems have not been experienced for any other systems using the multiple fermentation tube (MFT) technique within the entire Central California Region. **In one instance, the City collected replacement samples 22 times before breaking the repeating invalidation cycle and obtaining reportable results**.

Frequent and repeated replacement of samples prolongs the determination of the microbial safety of the public water supply. Such delays may allow unacceptable health risks associated with hazards such as cross-connection contamination or microbial contamination to go undetected. Generally, water systems that have had invalidation problems with the MFT technique have converted to other acceptable microbiological analysis techniques that do not produce invalid results. Other utilities also quickly address identified biofilm problems by flushing and continuously chlorinating their water

supply systems.

Microbiological growth that causes cloudiness in samples being evaluated for bacteriological water quality has remained a problem in the examination of water samples collected from the Lodi distribution system for many years and remains a serious problem today. The average rate of invalidation of bacteriological samples in the year 2000 was 26 samples per month. Data for the first 9 months of 2000 show an average rate of invalidation of bacteriological samples of 25 samples per month. These data show that the City's invalidation numbers remain unusually high.

In the recent past, the City has implemented a plan to chlorinate the system when needed to avoid total coliform-positive violations. This plan implements the City's strategy of "trying to chlorinate the system when needed to avoid total coliform violations". The City presented this strategy in its PSR report, dated March 4, 1998. The need for chlorination is based on the threat of Total Coliform Rule failures that increase as the number of total coliform positive results approaches the MCL each month. Generally, in response to those threats, the City practices chlorination at specific sites in the distribution system where monitoring indicates that increased microbiological activity is occurring.

Because of the interference experienced in bacteriological monitoring using the MTF method, unusually frequent invalidation of samples due to turbidity in the cultures and an MCL violation, the City of Lodi was issued Citation No. 03-10-98C-002 in March 1998. That citation directed the City of Lodi to submit a Distribution System Biofilm Control Plan (DSBC plan) to the Department. The City of Lodi, violated the directive issued by the Department of Health Services in Citation No. 03-10-98C-002 by failing to submit such a plan. Subsequently, the Department issued Citation No. 03-10-01C-005 in August of 2001 in response to this violation (failure to submit the required report).

In response to Citation No. 03-10-01C-005, the City of Lodi submitted a draft of the Bacteriological Water Quality Study by Boyle Engineering Corporation to the Department

with a cover letter dated October 5, 2001. The report contains several conclusions, including the conclusion that, "The waters produced by the various wells are currently not being chlorinated in a significant manner on an ongoing basis." The report also recommends measures that the City should implement to improve the bacteriological quality of the water served to its water customers. Measures related to well construction and maintenance, Granular Activated Carbon (GAC) treatment facilities, distribution system storage facilities, distribution system sampling, and general topics related to bacteriological water quality are among the recommendations. The Boyle Report states that it should not be concluded that making the recommended corrections and improvements related to the construction and maintenance of the City's wells will not lead to significant improvements in the bacteriological quality of the **water produced by the various wells**. The City's cover letter states that the study found no major deficiencies that once corrected would ensure a marked difference in the bacterial quality of the water. While the City's interpretation may be relevant when considering the source water produced by the wells, it ignores the most significant recommendation documented in the Boyle Report, a recommendation that focuses on the quality of the water served to the Lodi water customers through the distribution system. The Boyle Report's most significant recommendation is that chlorination of the water entering the distribution system is essential to control the microbiological activity that is prevalent **in the City's distribution system**. This recommendation, when implemented with the remaining recommendations, will significantly improve the bacteriological water quality of the "water delivered to system customers" and improve the City's ability to restore timeliness to the monitoring of the bacteriological quality of the water in the distribution system.

CONCLUSIONS OF LAW

Based on the above Findings of Fact, the Department finds that the City of Lodi has

violated, and has not implemented appropriate corrective measures to abate violations of Sections 64426.1(b)(1), Chapter 15, Division 4 of Title 22 of the California Code of Regulations.

ORDER

Pursuant to Section 116655 of the California Health and Safety Code (CHSC), the Department hereby orders Respondents, the City of Lodi to do the following, to bring the water system into compliance with all applicable drinking water standards:

1. By January 1, 2002, all of the water produced by the City shall be chlorinated on a continuous basis to achieve and maintain a chlorine residual of 0.5 to 0.7 mg/L throughout the distribution system and in the storage tanks at all the times. The City shall submit a plan and schedule to the Department, which will achieve implementation of the required chlorination by this date. This plan should include appropriate distribution system flushing in conjunction with the initiation of chlorination.

2. By January 31, 2001, the City shall submit a plan a plan and schedule, for approval by the Department, for implementation of the remaining recommendations in Section 1.2, Recommendations, of the Bacteriological Water Quality Study prepared for the City of Lodi by Boyle Engineering Corporation, and submitted to the Department on October 5, 2001, pursuant to the requirements of Citation No. 03-10-01C-005.

The Department reserves the right to make such modifications to this Order as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be effective upon issuance.

All submittals required by this Order shall be addressed to:

Joseph O. Spano
District Engineer
Drinking Water Field Operations Branch
31 E. Channel Street, Room 270
Stockton, California 95202

If Respondents are unable to perform the tasks specified in this Order for any reason, whether within or beyond Respondents' control, and if Respondents notify the Department in writing no less than fifteen days in advance of the due date, the Department may extend the time for performance if Respondents demonstrate that they have used their best efforts to comply with the schedules and other requirements of this Order. If Respondents fail to perform any of the tasks specified in this Order by the time prescribed herein or by the time as subsequently extended pursuant to this paragraph, Respondents shall be deemed to have not complied with the obligations of this Order and may be subject to additional judicial action including civil penalties specified in the Health and Safety Code, Section

116725.

The Department shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by the Respondents, its employees, agents or contractors in carrying out activities pursuant to this Order, nor shall the Department be held as a party to any contract entered into by the Respondents or its agents in carrying out activities pursuant to this Order.

By issuance of this Order, the Department does not waive any further enforcement action.

PARTIES BOUND

This Order shall apply to and be binding upon the Respondents, its officers, directors, agents, employees, contractors, successors, and assignees.

SEVERABILITY

The requirements of this Order are severable, and Respondents shall comply with each and every provision thereof, notwithstanding the effectiveness of any other provision.

CIVIL PENALTIES

Subparts (c) and (e) of Section 116650 of the CHSC provide for assessing an administrative civil penalty for violation of the requirements of Chapter 7. Failure to comply with any provision of this order will result in the Department imposing an administrative penalty not to exceed two hundred dollars fifty dollars ($250) per day as of the date of violation of any provision of this order.

10-25-01
Date

Richard Haberman, P.E., Chief
Central California Section
Southern California Branch
DRINKING WATER FIELD OPERATIONS

A:\3910004\ Chlorination Compliance Order.1001

CITY OF LODI

PUBLIC WORKS DEPARTMENT

CITY HALL, 221 WEST PINE STREET
P.O. BOX 3006
LODI, CALIFORNIA 95241-1910
(209) 333-6706
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October 5, 2001

California Department of Health Services
Drinking Water Field Operations Branch, Stockton District
Attention: Mr. Joseph Spano, District Engineer
31 East Channel Street, Room 270
Stockton, CA 95202

SUBJECT: Additional Responses to Citation No. 03-10-01C-005

Per our discussion at the August 31, 2001 meeting and your September 23, 2001 letter, enclosed is a draft of the Bacteriological Water Quality Study by Boyle Engineering.

The study found no major deficiencies that once corrected would ensure a marked difference in bacterial quality of the water. The detailed biofilm study element of the scope of work was never performed, because, in the opinion of the consulting engineer, it was not felt necessary. We certainly hope that this detailed investigation of Lodi's water system regarding bacteriological factors will satisfy Citation No. 03-10-01C-005. Please review the study and send comments back to the City as you feel necessary.

Concerning the laboratory procedures for coliform bacteria analysis, the City has initiated the analysis procedure per your September 26, 2001 letter (enclosed). Each month the bacteriological sampling reports will be sent to your office and the results can be reviewed by your office. At the end of the 6-month period mentioned in your letter, the City will continue the analysis procedure outlined in your September 26, 2001 letter unless another procedure is agreed upon.

If you have any questions or comments, please contact me at (209) 333-6740.

Frank Beeler
Assistant Water/Wastewater Superintendent

FB/fb
Enclosures

cc: Richard C. Prima, Jr., Public Works Director
Fran E. Forkas, Water/Wastewater Superintendent
Michael Schafer, Laboratory Services Supervisor
Mr. Richard Haberman, P.E., Department of Health Services, Drinking Water Field Operations
1040 East Herndon Avenue, Suite 205, Fresno, CA 93720-3158
(include copy of draft study)

STATE OF CALIFORNIA—HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 E. CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696
FAX (209) 948-7451

September 26, 2001

Frank Beeler
City of Lodi
221 W. Pine Street, PO Box 3006
Lodi, CA 95241-1910

RESPONSE TO CONCERNS REGARDING CITATION NO. 03-10-01C-005

The Department has received your letter of September 6, 2001, regarding the meeting of August 31, 2001, during which the provisions of Citation No. 03-10-01C-005 were discussed. Thank you and Mr. Schafer for sharing your views on the topics addressed in the referenced citation.

With respect to the comprehensive evaluation of the problems the City experiences with biofilms and a plan for controlling the biofilm in the Lodi distribution system, the Department looks forward to receiving the report prepared by your consultant regarding this issue. Data submitted by the City seem to indicate that the City is not nearly as opposed to chlorination as you indicate. The data suggest that the City utilizes chlorination as needed to avoid failures of the Total Coliform Rule (TCR). That suggests that the City acknowledges the value of chlorination in controlling the growth of microbiological organisms in its distribution system, but only exercises such control to the extent necessary to avoid TCR violations, rather than making a best effort to control growth at all times.

Although the meeting was conducted on August 31, the Department has not yet received the report relevant to comprehensive distribution system evaluation and the control of microbial growth that is evident in the City's distribution system, based on the microbial monitoring that the City performs each week. If the report is not received by the Department by November 1, 2001, a citation with an administrative penalty will be issued to the City. In submitting the report, please submit one copy to the Stockton District office for my review and a duplicate copy to the Fresno Regional office for review by Mr. Haberman.

With respect to the submission of monitoring reports, it was agreed that for monitoring, other than microbiological monitoring, conducted in any month, the City will accumulate and evaluate the results in the month following the collection of samples. Subsequently, by the tenth of the month following that

month in which data accumulation and evaluation is completed, the City will submit all data to the Department's Stockton District office.

Your letter of September 6, 2001, included the statement, "Mr. Haberman commented to the effect that many reports come in much later than Lodi's, and he did not seem to have a problem with the current arrangement". My notes indicate that Mr. Haberman was in agreement with the 70 day turn around time, and did not promote a more lengthily data reporting cycle. Follow-up discussions with Mr. Haberman confirms that he supports the 70 day turn-around time and had no intention to indicate otherwise.

At the meeting it was agreed that the City will initiate a 6-month monitoring program in which bacteriological samples will be evaluated according to the Multiple Tube Fermentation (MTF) technique. During that program, the City will transfer samples with growth in the presumptive stage, with no gas production, to the confirmed stage. Any positive results that occur during the confirmed stage will be considered positive for total coliform and reported as such. Those samples that do not produce positive results in the confirmed stage will be considered negative for total coliform and reported as such. No samples will be invalidated. As required in the MTF technique, the required number of samples will be processed through the completed phase of the test. Our Department firmly believes that once the corrective measures are outlined in the requested distribution system evaluation referred to in the 2nd paragraph of this letter, the coliform monitoring problems experienced by the City will be corrected also.

Please assure that the delivery of the copies of the report regarding the microbial growth problems in the City's distribution system to the Department are expedited. Also inform me of your thoughts relevant to the coliform testing at your earliest convenience. If you have any questions, contact me at 948-3816.

Joseph O. Spano

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

A:\3910004\Lodi Follow-up Letter-Citation 03-10-01C-005-Fnl.901

CITY OF LODI

PUBLIC WORKS DEPARTMENT

CITY HALL, 221 WEST PINE STREET
P.O. BOX 3006
LODI, CALIFORNIA 95241-1910
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September 6, 2001

California Department of Health Services
Drinking Water Field Operations Branch, Stockton District
Attention: Mr. Joseph Spano, District Engineer
31 East Channel Street, Room 270
Stockton, CA 95202

SUBJECT: Reply to Citation No 03-10-01C-005

Your office issued enclosed Citation No. 03-10-01C-005, dated August 6, 2001, to the City of Lodi drinking water system.

On Friday, August 31, 2001, you, Supervising Sanitary Engineer Richard Haberman and Sanitary Engineer Tahir Mansoor met with City Laboratory Services Supervisor Michael Schafer and me in your office. We discussed the directives contained in the above citation. Below is a discussion of the Directives as numbered in the citation and a summary of the outcome of our discussions at the above meeting.

1. The City agrees that this item from a previous directive has not been adequately responded to by the City of Lodi. We have experienced some frustration in getting this item addressed. There were no applicable references found or any similar type studies located to give City staff adequate direction. Eventually it was decided to have a consulting firm do an evaluation of the entire drinking water system. The consultant spoke with you before completing the evaluation's scope of work (enclosed). The scope of work included a biofilm element, which we envisioned would address your directive.

   While the comprehensive evaluation of the drinking water system was conducted, the consultant determined that a detailed evaluation of the biofilm was not necessary. A final draft of the study will be forwarded to you for your review. As discussed in our meeting, this comprehensive system evaluation should comply with the intent of the citation's directive.

2. There was agreement that the regulations read that reports received by the water supplier in a calendar month are to be reported to the Department by the tenth day of the following month. The City currently waits until all laboratory reports of monitoring for a calendar month are received. Thereafter, all

laboratory reports for that month are sent to your office along with a cover letter detailing the sampling activities for each well and other pertinent details concerning sampling results and sampling frequencies. There are also two summaries included that also accompany the letter, which summarize laboratory results. The City concedes that the reports sometimes exceed the above timeframe, but we feel it is important to take the time to track analyses and compliance for each well and constituent for the benefit of the City and the Department. Any monitoring results that cause an exceedance of regulations or other triggers were handled by a phone call and/or fax to your office. You agreed there have been no reporting problems resulting from the previous arrangement. Mr. Haberman commented to the effect that many reports come in much later than Lodi's, and he did not seem to have a problem with the current arrangement.

The meeting ended with our offer to try and meet the timeframe in the regulations cited above in the sense that reports for a month are generally received in the following calendar month therefore results will try and be reported by the tenth of the following month (i.e., January analyses will try and be summarized and reported by the tenth of March, unless any individual result triggers a quicker response to your office).

(Currently the City has not received all laboratory results for samples taken in July 2001. For all analyses received in September for the July samples, regulations dictate that we only get them to your office by the tenth of October. The City will not wait, but will summarize results then send in all July sampling reports as soon as we can.)

3. The laboratory procedures for coliform bacteria were discussed at some length. There is some ambiguity in federal regulations compared to the federally approved "Standard Methods", which dictates the procedures for approved laboratory analyses. The directive to submit presumptive non-gas forming tubes in Multiple-Tube Fermentation Technique to the confirmed stage, and thereafter invalidate and resample would cause an extra two days' delay for any resampling.

   You requested that Lodi should invalidate at the presumptive stage, resample and continue the tubes to the confirmed stage. This would result in two concurrent samples being performed on one reportable sampling event. We stated that this certainly is neither the intent of nor a valid interpretation of regulations.

   Mr. Haberman concluded by saying Lodi should transfer samples with no gas formation, yet have growth in the presumptive stage, to the confirmed stage. If there are any positive results from the confirmed stage, they will be considered positive for total coliform and be reported as positive. If there are no positive results in the confirmed stage, the results would be considered negative for total coliform bacteria, be reported as such and not be invalidated.

Recapping the actions we will follow: First, we have contacted Boyle Engineering, who is preparing final drafts of the drinking water system evaluation study, and we will forward a copy to your office. Second, we will continue with analytical results reporting procedures as outlined in #2 above. Third, we will continue to invalidate samples at the presumptive stage and perform Coliert on the replacement samples (current procedure) until we get confirmation in writing from your office to proceed as directed by Mr. Haberman in #3 above.

If you have any questions or comments, please contact me at (209) 333-6740.

Frank Beeler
Assistant Water/Wastewater Superintendent

FB/fb
Enclosures

cc: Richard C. Prima, Jr., Public Works Director
Fran E. Forkas, Water/Wastewater Superintendent
Michael Schafer, Laboratory Services Supervisor
Mr. Richard Haberman, P.E., Department of Health Services, Drinking Water Field Operations
1040 East Herndon Avenue, Suite 205, Fresno, CA 93720-3158

STATE OF CALIFORNIA-HEALTH AND HUMAN SERVICES AGENCY

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 EAST CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696 FAX (209) 948-7451

06 August 2001

Fran E. Forkas
Water/Wastewater Superintendent
City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TRANSMITTAL OF CITATION NO. 03-10-01C-005

The City of Lodi, operating the City of Lodi domestic water system, violated a directive issued by the Department of Health Services in Citation No. 03-10-98C-002. The Department has issued Citation No. 03-10-01C-005 in response to this violation. The citation is being transmitted to the City of Lodi under cover of this letter.

Please respond to the directives by the deadlines established with each item. If you have any questions regarding this matter, please contact me at (209) 948-3816.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

Certified Mail No.: 7000 1670 0008 5533 9750

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT

IN RE: City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TO: Fran E. Forkas
Water/Wastewater Superintendent

CITATION No. 03-10-01C-005

CITATION FOR NONCOMPLIANCE: WATER SYSTEM NO. 3910004

Section 116650, Chapter 4 of Part 12 of Division 104 of the California Health and Safety Code (CHSC), authorizes the issuance of a citation for failure to comply with a requirement of Chapter 4 (California Safe Drinking Water Act), or any regulation, standard, permit, or order issued thereunder.

VIOLATIONS

The Department of Health Services, Division of Drinking Water and Environmental Management (hereinafter Department) hereby issues a citation to the City of Lodi (hereinafter City), Public Water System No. 3910004, for failure to comply with a directive contained in Citation No. 03-10-98C-002.

Specifically, the City failed to submit a Distribution System Biofilm Control Plan (DSBC plan) to the Department.

In accordance with Section 116650 of the CHSC, the above violation is classified as a continuing violation.

BACKGROUND

The City of Lodi is located approximately 10 miles north of the City of Stockton in San Joaquin County. The water system is owned and operated by the City of Lodi under authority of Water Permit No. 03-10-95P-005, granted by the Department on 12 May 1995, and its amendment (03-10-97PA-008) dated 31 July 1997.

The Lodi Water System serves a maximum population of approximately 57,000 people in the area via 16,753 service connections. The water supply is derived from twenty-four active groundwater wells located within the service area. Raw water from Wells 4R, 16, 18, 20, 22, and 23 is passed through granular activated carbon (GAC) filters prior to entering the distribution system. Beyond this, the City's water receives no additional treatment, with the exception of periodic chlorination and exposure to ultraviolet lamps.

Citation 03-10-98C-002 was issued on 23 March 1998 in response to the City's February 1998 violation of the Maximum Contaminant Level (MCL) for total coliform bacteria. In an effort to

encourage the City to investigate and address the source(s) of the bacteriological contamination, the Department issued a directive that required the City to:

> "Within 4 weeks of receipt of this citation, conduct a comprehensive evaluation of the biofilm problem that the City is experiencing and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than May 1, 1998."

The certified mail return receipt for this citation indicates that the City received this citation on 24 March 1998. The Department did not receive any further information regarding the required water system evaluation until June 1999, when the City sent a letter to the Department that included a copy of the "scope of services" for the study, which had yet to be performed. To this date the DSBC plan, which was due in April 1998, has not been submitted to the Department.

DIRECTIVES

The City of Lodi is hereby directed to:

1. Complete a comprehensive evaluation of the biofilm problem that the City has experienced and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than 30 September 2001.

   The evaluation, plan, and implementation schedule shall be submitted to the Department by 07 September 2001.

2. Submit all laboratory reports for analyses of drinking water samples to the Department within 45 days of the date of sampling, effective immediately. Laboratory results of any constituent(s) for which there is a storet code (or entry #) in the Write-On program must be reported on a Write-On form.

3. Submit bacteriological drinking water samples demonstrating growth without a positive gas or acid reaction in the presumptive phase of the multiple tube fermentation test to the

confirmed phase prior to invalidation of the sample. If there is no gas formation in the confirmed phase the sample shall then be invalidated. This is consistent with both the standard method for the multiple-tube fermentation technique and 40 Code Federal Regulations (CFR), Section 141.21(c)(2).

40 CFR 141.21(c)(2) states, "A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique)...." As specified in Standard Methods for Examination of Water and Wastewater, a drinking water sample showing turbidity without gas formation in the presumptive phase must be submitted to the confirmed phase to ensure that no total coliforms are detected. If the sample shows gas formation in the confirmed phase, the sample is considered to be positive. If the sample (showing turbidity without gas formation in the presumptive phase) does not show gas formation in the confirmed phase, it meets the criteria of 40 CFR 141.21(c)(2) and must be invalidated.

Beginning in September 2001, laboratory reports for bacteriological samples must verify that microbiological samples showing turbidity without gas formation in the presumptive phase of the multiple-tube fermentation test have been submitted to the confirmed phase before they are invalidated. Any such samples that produce gas in the confirmed stage shall be considered positive for total coliforms. Laboratory results for microbiological monitoring shall continue to be submitted to the Department on a monthly basis, along with the Monthly Summary of Distribution System Coliform Monitoring.

All submittals required by this citation shall be sent to:

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District
31 E. Channel Street, Room 270
Stockton, CA 95202

CIVIL PENALTIES

Section 116650(e)(3) of the CHSC allows for the assessment of a civil penalty for failure to comply with the requirements of the Safe Drinking Water Act. Failure to comply with any provision of this Citation may result in the Department imposing an administrative penalty of an amount not exceeding two hundred ($200) per day for each day the violation continues beyond the date specified for correction in the citation.

8-6-01
Date

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

A:\Citation (3910004) 0801.doc
Certified Mail No.: 7000 1670 0008 5533 9750

Work Tasks

Boyle Engineering Corporation shall perform the following work tasks:

Task 1 – Project Kick-Off Meeting and Meeting with DHS

This task consists of meeting with City staff and to collect project-related information consisting of various water quality data, various maps and plans, recent DHS correspondence and reports, in-house prepared reports, and reports from other consultants if applicable to this project. This task also includes a separate meeting with the DHS Stockton District Engineer to solicit DHS input into the study and to obtain relevant DHS file information.

Task 2 – Evaluation of Well Sites

An evaluation of the well sites will be performed for possible HPC and coliform bacteria contamination problems. We will review and evaluate the following:

- Surface well construction features (including current methods of pump lubrication used)
- Subsurface well construction features
- Land uses within a 250-foot radius around each wellhead
- Site drainage conditions
- Bacteriological sampling results (if available) obtained directly from each well within the last 5-year period
- Sample collection and sample point flushing/disinfection procedures being used and well sample point evaluation
- Operations and maintenance practices – normal operations and after pump repairs

Photographs of significant sanitary hazards found will be taken and documented in the report.

Task 3 – Evaluation of GAC Treatment Plants

An evaluation of the GAC treatment plant facilities will be performed for possible HPC and coliform bacteria contamination problems. We will review and evaluate the following:

- Construction features of the treatment facility components.
- The routine day-to-day operations/maintenance practices provided.
- Bacteriological sampling results (if available) obtained from the water entering and leaving the individual treatment vessels. Also perform AOC testing to determine possible contribution by the GAC.
- The special operations/maintenance procedures used when contactors are unloaded and reloaded with fresh GAC and when other equipment repairs are conducted.

Photographs of significant sanitary hazards found will be taken and documented in the report.

Task 4 – Evaluation of Existing Chlorination Treatment Equipment at Well Sites

The existing gas chlorination treatment facilities will be reviewed and evaluated. We will also provide cost estimates for the replacement of the gas chlorination facilities using either bulk stored, 12.5% sodium hypochlorite feeding facilities or the installation of on-site sodium hypochlorite generators (making a 0.8% available chlorine solution). These cost estimates will be prepared for:

- Sites now having chlorine gas feeding facilities
- Sites currently having no chlorination treatment facilities

Equipment needs will include chlorine residual analyzers/recorders and housing for the chlorine feed, monitoring, and feed control facilities.

This task will provide the City with budget cost estimates for compliance with the currently proposed Groundwater Rule by EPA, which may require mandatory disinfection treatment for all groundwater wells for bacteria/virus control.

We will also determine the currently available chlorine contact time from the point of chlorine application to the first water consumer and provide opinions on whether these chlorine contact times will be adequate for compliance with the current draft requirements of the GDR.

Boyle will also review the applicability of using UV disinfection at the well sites and evaluate recent past trial operations using UV disinfection in the City water system.

Task 5 – Evaluation of Water Storage Sites

The existing water storage sites will be reviewed and evaluated for possible HPC/coliform bacteria contamination problems. We will review and evaluate the following:

- The physical condition of each facility and whether significant structural defects exist externally and on the roofs that might pose bacteriological contamination problems. Internal inspections will be made to the extent possible.

- Available bacteriological sampling data generated directly from samples collected historically from each water storage site. This will be done for the data generated since May 1996.

- Operations and maintenance procedures used (normal operations and after cleaning and repair episodes) will be reviewed and evaluated.

- Facility inlet/outlet arrangements will be reviewed as to providing good water circulation and water turnover. Possible water stagnation problems within storage units will be discussed.

- Current sampling procedures and sampling locations will be reviewed to determine whether they should continue to be used.

- Existing (DHS requested) Operations Plans will be reviewed and improvement recommendations will be provided as appropriate.

Photographs of significant defects will be made and documented in the report.

Task 6 – Review of Historical Bacteriological Test Results from Distribution System

The bacteriological sampling program in the distribution system will be reviewed and evaluated. We will review and evaluate the following:

- Test results (coliform/fecal coliform/HPC bacteria, chlorine residual, and physical quality) from all sampling locations in the distribution system generated historically for the last 10-year period. This will include coliform positive and "cloudy" samples later invalidated as well as the HPC bacteria samples.

- Each currently used sampling location will be inspected in the field.

- The bacteriological sample siting plan, including each upstream and downstream repeat sampling station.

- The laboratory methods used for initial, repeat, and replacement samples for coliform bacteria analyses, including quality control.

- Discussion of reasons/causes for past sample invalidations.

- The laboratory methods used for HPC bacteria analyses.

- Laboratory procedures to identify the type(s) of HPC bacteria found in the city water system.

- Water sample handling and transportation procedures used.

- Water sample collection procedures being used.
- The historical sample replacement occurrences (criticized by DHS) will be reviewed.
- Evaluate advantages of installing dedicated sampling stations.

Task 7 – Distribution System Evaluations

Various aspects of the distribution system will be evaluated. These aspects will be as follows:

- The status of the City's cross-connection control program.
- The status of the City's water main flushing program.
- The extent of the City's historical chlorination treatment program and the magnitude and type of chlorine residuals obtained during treatment periods.
- The presence of underground air/vacuum release valves on transmission mains.
- The general separation of water and sewer lines throughout the City's water system.
- The presence of dead ends and the degree of flushing provided.
- Allowing private contractors to connect to existing water system.

Task 8 – New and Repaired Water Main Considerations

The procedures by City staff used in installing, flushing, and sampling of new waterlines will be evaluated. The degree of City inspection/oversight during construction by contractors will also be reviewed. The procedures used in repairing existing water mains will be evaluated. This will be done for instances where water mains are repaired under pressure and for water mains that are first dewatered, repaired, and then repressurized. The repair procedures used, such as flushing, disinfection, and sampling, will be reviewed.

Task 9 – Biofilm Confirmation

Boyle staff will assist City staff to confirm the presence of a suspected "biofilm" on the inside surfaces of pipelines. This will be done to the extent possible using the following approaches:

- High-velocity flushing, water sampling, and concentrating the precipitates for later microscopic analyses
- Pigging of pipelines, water sampling, and concentrating the precipitates for later microscopic analyses
- Visual pipeline inspection at two or three locations where pipelines are being replaced, scraping of pipe deposit for later microscopic analyses

Task 10 – Adequacy of Operational Staff

The existing field staff will be evaluated for adequacy of training and operator certification. We will evaluate whether the current number of operators can adequately operate, maintain, and monitor the existing water system facilities in a sanitary manner.

This task will also provide recommendations for additional staff necessary to implement and maintain all recommended improvements as a result of this report.

Task 11 – Preparation of Draft Engineering Report and Internal Quality Control

The findings, conclusions, and recommendations generated by Tasks 1 through 10 will be documented in a draft report. A total of five copies of the draft report will be provided to the City for review and comments. Prior to submitting the draft report to the City, it will be reviewed for quality control purposes by Glenn McPherson, managing engineer of Boyle's Sacramento office.

Task 12 – Draft Report Review and Other Client Meeting

A meeting will be held with City staff to discuss the draft report and the City's draft report review comments. A final project meeting will be attended with City management staff. A project presentation meeting will be attended at a City Council meeting.

Task 13 – Preparation of Final Engineering Report

The final report will be prepared incorporating the City's draft report review comments. A total of ten final report copies will be provided to the City.

Task 14 – Optional Work Task – Two-Year Travel Time Calculations

Boyle will perform EPA/Source Water Assessment evaluations, namely to estimate the "Two-Year Zone of Contribution" for each well. This will be done using existing available information related to underground geology, hydrology, and subsurface well construction. Note: This work task was suggested to the City by the California Department of Health Services.

Task 15 – Optional Work Task – Procedures Manual for Work on City Water Mains by City Staff and Contractors

Boyle will meet with City staff to outline the Procedures Manual to be prepared. After a draft of the manual has been completed, Boyle staff will again meet with City staff to discuss the draft manual, then revise it and prepare the final Procedures Manual. The City will be supplied with one reproducible copy of the final manual.

STATE OF CALIFORNIA-HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF HEALTH SERVICES
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS
31 EAST CHANNEL STREET, ROOM 270
STOCKTON, CALIFORNIA 95202
(209) 948-7696 FAX (209) 948-7451

06 August 2001

Fran E. Forkas
Water/Wastewater Superintendent
City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TRANSMITTAL OF CITATION NO. 03-10-01C-005

The City of Lodi, operating the City of Lodi domestic water system, violated a directive issued by the Department of Health Services in Citation No. 03-10-98C-002. The Department has issued Citation No. 03-10-01C-005 in response to this violation. The citation is being transmitted to the City of Lodi under cover of this letter.

Please respond to the directives by the deadlines established with each item. If you have any questions regarding this matter, please contact me at (209) 948-3816.

Joseph O. Spano

Joseph O. Spano. P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

Enclosures

Certified Mail No.: 7000 1670 0008 5533 9750

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
DIVISION OF DRINKING WATER AND ENVIRONMENTAL MANAGEMENT

IN RE: City of Lodi
1331 South Ham Lane
Lodi, CA 95240

TO: Fran E. Forkas
Water/Wastewater Superintendent

CITATION No. 03-10-01C-005

CITATION FOR NONCOMPLIANCE: WATER SYSTEM NO. 3910004

Section 116650, Chapter 4 of Part 12 of Division 104 of the California Health and Safety Code (CHSC), authorizes the issuance of a citation for failure to comply with a requirement of Chapter 4 (California Safe Drinking Water Act), or any regulation, standard, permit, or order issued thereunder.

VIOLATIONS

The Department of Health Services, Division of Drinking Water and Environmental Management (hereinafter Department) hereby issues a citation to the City of Lodi (hereinafter City), Public Water System No. 3910004, for failure to comply with a directive contained in Citation No. 03-10-98C-002.

Specifically, the City failed to submit a Distribution System Biofilm Control Plan (DSBC plan) to the Department.

In accordance with Section 116650 of the CHSC, the above violation is classified as a continuing violation.

BACKGROUND

The City of Lodi is located approximately 10 miles north of the City of Stockton in San Joaquin County. The water system is owned and operated by the City of Lodi under authority of Water Permit No. 03-10-95P-005, granted by the Department on 12 May 1995, and its amendment (03-10-97PA-008) dated 31 July 1997.

The Lodi Water System serves a maximum population of approximately 57,000 people in the area via 16,753 service connections. The water supply is derived from twenty-four active groundwater wells located within the service area. Raw water from Wells 4R, 16, 18, 20, 22, and 23 is passed through granular activated carbon (GAC) filters prior to entering the distribution system. Beyond this, the City's water receives no additional treatment, with the exception of periodic chlorination and exposure to ultraviolet lamps.

Citation 03-10-98C-002 was issued on 23 March 1998 in response to the City's February 1998 violation of the Maximum Contaminant Level (MCL) for total coliform bacteria. In an effort to

encourage the City to investigate and address the source(s) of the bacteriological contamination, the Department issued a directive that required the City to:

> "Within 4 weeks of receipt of this citation, conduct a comprehensive evaluation of the biofilm problem that the City is experiencing and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than May 1, 1998."

The certified mail return receipt for this citation indicates that the City received this citation on 24 March 1998. The Department did not receive any further information regarding the required water system evaluation until June 1999, when the City sent a letter to the Department that included a copy of the "scope of services" for the study, which had yet to be performed. To this date the DSBC plan, which was due in April 1998, has not been submitted to the Department.

DIRECTIVES

The City of Lodi is hereby directed to:

1. Complete a comprehensive evaluation of the biofilm problem that the City has experienced and submit a Distribution System Biofilm Control Plan (DSBC plan), outlining the methods and procedures used in the evaluations and experimentation, the findings, and a strategy for controlling or eliminating the biofilm activity in the City's water distribution system. The DSBC plan shall address, but not be limited to, the methods that will be used to detect biofilm growth in the distribution system on an ongoing basis, plans and procedures to mitigate the distribution system biofilms, and measures that will be instituted to monitor and control future timeliness of the City's coliform monitoring program and failures of the Total Coliform MCL. An expeditious implementation schedule shall be included to assure that the plan is implemented no later than 30 September 2001.

   The evaluation, plan, and implementation schedule shall be submitted to the Department by 07 September 2001.

2. Submit all laboratory reports for analyses of drinking water samples to the Department within 45 days of the date of sampling, effective immediately. Laboratory results of any constituent(s) for which there is a storet code (or entry #) in the Write-On program must be reported on a Write-On form.

3. Submit bacteriological drinking water samples demonstrating growth without a positive gas or acid reaction in the presumptive phase of the multiple tube fermentation test to the

confirmed phase prior to invalidation of the sample. If there is no gas formation in the confirmed phase the sample shall then be invalidated. This is consistent with both the standard method for the multiple-tube fermentation technique and 40 Code Federal Regulations (CFR), Section 141.21(c)(2).

40 CFR 141.21(c)(2) states, "A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique)...." As specified in Standard Methods for Examination of Water and Wastewater, a drinking water sample showing turbidity without gas formation in the presumptive phase must be submitted to the confirmed phase to ensure that no total coliforms are detected. If the sample shows gas formation in the confirmed phase, the sample is considered to be positive. If the sample (showing turbidity without gas formation in the presumptive phase) does not show gas formation in the confirmed phase, it meets the criteria of 40 CFR 141.21(c)(2) and must be invalidated.

Beginning in September 2001, laboratory reports for bacteriological samples must verify that microbiological samples showing turbidity without gas formation in the presumptive phase of the multiple-tube fermentation test have been submitted to the confirmed phase before they are invalidated. Any such samples that produce gas in the confirmed stage shall be considered positive for total coliforms. Laboratory results for microbiological monitoring shall continue to be submitted to the Department on a monthly basis, along with the Monthly Summary of Distribution System Coliform Monitoring.

All submittals required by this citation shall be sent to:

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District
31 E. Channel Street, Room 270
Stockton, CA 95202

CIVIL PENALTIES

Section 116650(e)(3) of the CHSC allows for the assessment of a civil penalty for failure to comply with the requirements of the Safe Drinking Water Act. Failure to comply with any provision of this Citation may result in the Department imposing an administrative penalty of an amount not exceeding two hundred ($200) per day for each day the violation continues beyond the date specified for correction in the citation.

8-6-01
Date

Joseph O. Spano, P.E.
District Engineer
Drinking Water Field Operations Branch
Stockton District

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